

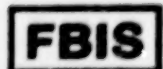
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28 November 1983

# USSR Report

ENERGY

No. 167



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## OIL AND GAS

### AZNEFT' GENERAL DIRECTOR DESCRIBES ACTIVITIES, STATUS OF ASSOCIATION

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 83 pp 1-5

[Article by B. A. Gadzhiyev, General Director of Azneft' [State Association of the Azerbaijan Oil Industry]: "In the Mainline Direction"]

[Text] The anticipatory development of the fuel and power complex is one of the most important tasks set by the party for the 11th Five-Year Plan and for the 1980's as a whole. This is emphasized with persuasive force in the historic decisions of the 26th CPSU Congress and the 30th Azerbaijan CP Congress and it has found further development and specificity relative to the present in the program documents of the November 1982 CPSU Central Committee Plenum, the profound speech of CPSU Central Committee General Secretary Comrade Yu. V. Andropov and the December 1982 Azerbaijan CP Central Committee Plenum. In implementing the party's decisions, the collective of the country's oldest Order of Lenin association, Azneft', carried out with honor the 1982 plan for oil and gas recovery and the socialist commitments that had been undertaken, having recovered 6,000 tons of crude and 180 million m<sup>3</sup> of gas above the goal and stepped up work on all sectors of the oil front during the current, core year of the 11th Five-Year Plan. Azneft' oilfield workers fulfilled the plan for the first 4 months of 1983 for oil recovery by 100.2 percent, for gas recovery by 113.5 percent and for drilling by 103.9 percent. On the socialist commitments account, about 2,500 tons of crude and about 31 million m<sup>3</sup> of gas were recovered and more than 5,000 meters of rock were penetrated.

In carrying out the tasks set by the party, Azneft' oilfield workers are becoming ever more involved in the areas of exploration and development of the republic's promising central and western regions, they are intensifying operations in the so-called "old" areas, and they are improving work on the well inventory. At the December 1982 Azerbaijan Communist Party Central Committee Plenum, First Secretary of the Azerbaijan CP Central Committee Comrade K. M. Bagirov set before the republic's oilfield workers a specific task--to stabilize and then to increase oil recovery steadily. In spending all their efforts on achieving this high goal, the Azneft' collective fought systematically to reduce the rate of drop of oil recovery: while at the end of the 10th Five-Year Plan it was 5.7 percent, in 1982 it was 0.8 percent. Work in this area will be continued and intensified, for therein lies the key to resolving the 1983 task set for Azneft' oilfield workers, and it is a guarantee of successful implementation of the plans for the whole 11th Five-Year period.

The Azneft' Association is developing more than 40 oilfields, which are situated basically on the Apsheron Peninsula, in the Kura lowland and at the Siazan monocline. Despite the prolonged exploration and development of oil and gas fields on Azerbaijan soil, the earth still contains unrecovered mineral reserves. The pace of recovery of our unrealized reserves still is low. Raising the utilization factor of the unrealized reserves is the most realistic path toward solution of the problem of stabilizing and increasing oil recovery. Azneft' oilfield workers, in realizing this program, have painstakingly and purposefully worked on the existing well inventory. In 1982 alone 28,000 geological engineering measures were taken and 6,000 were performed to stimulate the bottom-hole zone of the wells, and there were 3,000 workovers and 98,500 underground repairs. As a result of multifaceted work on the well inventory, a certain positive trend was noted: since the start of the five-year plan, the number of inactive wells has been cut from 800 to 250, and many technical and economic indicators have improved.

The area of introduction of highly effective secondary and tertiary methods for increasing withdrawal from the formations is being widened. Work in this area has been stimulated during the 11th Five-Year Plan. Azneft' oilfield workers are injecting into the formations each year about 23 million m<sup>3</sup> of water in order to stimulate the reservoir. Various tertiary methods for oil recovery that are applicable to the situation are being introduced: steam-heat stimulation at the Binagady, Puta-Kushkhana and Khorasany areas, surfactant injection at Kyurovdag and Kyursangya and microfoam systems at Surakhany and Karachukhur. In-situ combustion created at Khorasany, Koshanaur and Surakhany is proving itself well. In the long term, final oil withdrawal from the reservoirs through the integrated use of secondary and tertiary methods will be increased 1.5-fold.

The most important tasks that now face the association are in the area of reequipping oilfield facilities. The currently used bottom-hole pump and compressor methods of operation, where there is high water encroachment (this has reached 95 percent at Apsheron), involve large power expenditures per ton of crude recovered. Given high requirements for saving fuel and power, new and more rational technical means for operation, which will provide for minimal consumption of electricity and metal, are necessary. One of these means is the use of submerged electrical centrifugal pumps. A restructuring of the Office for Operation and Repair of Submerged Electrical Installations started during the 11th Five-Year Plan, in the near future its capacity will increase greatly and, consequently, the area of the pumps' application will be expanded.

Highly effective diaphragm pumps have successfully passed tests at Azneft' oilfield facilities under the most trying well conditions. They will increase 4-fold the time between repairs. Such pumps could be introduced right now at a third of Apsheron's wells, enabling expenditures on expensive pumps to be reduced, electricity to be saved and underground repair and workover of the wells to be cut. This is just a word for the republic's machinebuilding plants, which should organize serial output of diaphragm pumps during this five-year plan.

The basis for carrying out all our plans is painstaking and purposeful work on the well inventory. Azneft' Association has at its disposal a large well

inventory--11,000 units, but three-fourths of the wells were drilled more than 30 years ago and have long since passed their amortization dates. The technical condition of the strings is such that engineering oilfield studies can be conducted and secondary and tertiary methods of oil recovery can be introduced at only a fourth of the wells. At Apsheron, for example, where six NGDU's [oil and gas recovery administrations] are concentrated, only a third of the wells get oil from the fields' lower stages, in which the main portion of the recoverable reserves are located. In order to eliminate this discrepancy, more than 5,000 new wells must be drilled on the Apsheron Peninsula, to make it possible to regulate closely the network, which is a sparse one at present, at fields that can be developed for a long time. Since the start of the 11th Five-Year Plan, Azneft' oilfield workers have undertaken to fulfill this program, and partial accomplishment of it has already enabled oil recovery in this area to be raised considerably. In order to show how effective this program is, I shall cite only one example. The Karadagneft' [Karadag Oil Production Association] NGDU, which, according to 10th Five-Year Plan results, was among the laggards, not only stabilized oil recovery during the first year of the 11th Five-Year Plan but also increased it by 6.5 percent over the preceding year. The collective was presented the Red Banner for its 1982 results as winner of the republic's socialist competition. Of course this success was made up of many factors: the drive for maximum yield from each well, for preserving the operating inventory, for returning all the inactive wells to operation, for increasing time between repair periods and so on. But the main and deciding factor was introduction at the Karadagneft' NGDU of a scientifically substantiated design for stripping that called for the sinking of 820 production and injection wells, as a result of which the oil-recovery level will be raised substantially in this region by the end of the decade.

Drilling is the leading edge of the oil front. During the 11th Five-Year Plan the amount of operational and exploratory drilling has been increasing by, respectively, 40 and 60 percent.

The policy of intensifying geological exploration, which the association's collective adopted for the 11th Five-Year Plan, is a guarantee of successful reaching of the goals set by the party for stabilization of and growth in oil recovery. The Azerbaijan Communist Party Central Committee is guiding us in concentrating capital investment, which will give high economic benefit, and, therefore, increased meterage in exploration penetration, and Azneft' oilfield workers are concentrating it entirely on the more promising structures, such as the Muradkhanly, Zardob, Pirsagat, Neftechala and Yuzhnaya Kyursangya areas, the area between the Kura and Yuri rivers, and so on. The underground explorers are persistently struggling to increase the effectiveness and quality of their work and to increase the amounts of and growth in penetration speeds. This task is difficult because the association still does not have at its disposal an adequate number of bases, drill rigs, and so on, for carrying out such a strenuous program, which is 1.5-fold that of the 10th Five-Year Plan. Unfortunately, cases of interruption of this program by various drilling brigades, and even by whole enterprises, are not rare; this affects negatively all the technical and economic indicators for exploratory drilling as a whole. Breakdowns, complications in making hole and violations of drilling procedures still have not been overcome. The elimination of these deficiencies and a rise in yield by each drilling brigade are the main reserves for improving



drilling-enterprise operations. However, aside from internal reserves, which must be found and put to the service of production quickly, oil exploration and timely and considerably improved supplying of materials and equipment are needed. The drill-rig pool is very much worn, almost half of it is subject to writeoff, and a substantial number of rigs fall short of the standards.

A great impediment to the buildup of facilities in new areas is the absence of a supply-and-equipment base in the republic's remote regions, so solution of the problem of creating such a base must be stepped up in every possible way.

New fields are being developed by clustered slant directional drilling, which, besides saving time, funds, labor and metal, enables preservation of the inviolability of the republic's natural environment: it is sparing a large forest in the Siazany area, and it permits oil to be recovered from beneath a forest preserve in the Muradkhanly area. Modern methods of oil recovery that are being used in the new oil regions incorporate the problems of protecting the environment. However, the old Apsheron areas were developed decades ago without taking these matters into account. Usual features of Apsheron landscapes and the Baku vicinity are a forest of black derricks and smeared land. The picture has existed for the 120 years of development of the Apsheron fields, and it is very difficult--but necessary--to change it. Azneft' oil-field workers are operating over a broad front to recultivate Apsheron land and to bring the oilfield facilities into a state that will meet modern esthetic demands for production and environmental protection.

This work is complicated and requires large material and labor expenditures, but these are being repaid. A closed system for gathering and transporting the product will be created. Highly effective also is the conversion of Apsheron's oilfield facilities to the derrickfree method of operation, under which the metal intensiveness of oil and gas recovery enterprises will be greatly reduced and the utilization coefficient of lifting structures will be raised.

The November 1982 CPSU Central Committee Plenum emphasized with new force the necessity for further wide use of science's potential in the national economy. Azneft' Association works in close contact with tens of collectives of the country's and the republic's scientific-research institutes. Many most valuable developments which have been successfully introduced in the fields of drilling, oil recovery, underground repair and workover originated in AzNIPIneft' [Azerbaijan Scientific-Research and Design Institute of the Oil Industry], and new methods for stimulating oil-bearing formations were created there. Struggling to intensify oil recovery, AzNIPIneft' scientists created more than 40 designs for the further stripping of the existing fields that Azneft' operates, and they identified more than 7,000 points for drilling for residual crude. Special attention is being paid today to problems of implementing an integrated plan for geological prospecting and exploration for oil and gas. These are to be intensified in Azerbaijan's western regions and in areas of the Lower Kura depression, where definite positive results have already been obtained in many sectors. Work must be expanded more widely in order to discover new deposits in effusive formations of the upper Carbonaceous and the Paleogene in the Muradkhanly and Zardob areas. Much work must be done here to master wells that are being introduced by means of new methods



of stimulation of the bottom-hole zone where the formation pressures are anomalously high.

The development of new fields and improvement in the development of existing ones will depend greatly upon the quality of drilling and the timely introduction of new wells into operation. It is necessary, therefore, to introduce widely into practice new developments in drilling equipment and technology, to include measures for the drive against complications, rules for operating processes when making hole, and so on. At the same time, the quality of the design documentation must be raised, and designers' surveillance over the execution of designs for drilling wells must be strengthened.

AzINmash [Azerbaijan Scientific-Research Institute of Petroleum Machinebuilding] scientists, who create the necessary equipment and execute designers' surveillance over the association's oilfield facilities, extend great practical assistance. Scientists of VNIIBT [All-Union Scientific-Research Institute for Drilling Equipment] are introducing progressive drilling equipment in our drilling organizations. At present they are doing much work in the field of deep drilling, and they are introducing turbodrills with reduction gear, core tools and so on. Krasnodar's science-and-production association Soyuztermneft' prepared flow charts for in-situ combustion for the Khorasany and Umbaki fields; PechorNIPIneft' [Pechora Scientific-Research and Design Institute for the Oil Industry] makes up designs for underground-mine and quarry excavations; and SevKavNIPIneft' [North Caucasus Scientific-Research and Design Institute for the Oil Industry] is preparing a flow chart for pumping high-pressure hydrocarbon gas at the Kyursangya, Karabagly and Kyurovdag fields.

However, there are still many unresolved problems to which I would like to call the scientists' attention. Oilfield workers' labor, especially during the underground repair and workover of wells, is heavy, it is not mechanized very much, and it is not esthetic. The matter of special clothing for the workers has been going extremely unsatisfactorily. The existing models do not at all match the conditions of our region, and it would be extremely desirable that the All-Union Scientific-Research Institute for Labor Safety in the Oil Industry and other organizations tackle this urgent problem. For there is a potential for progress in underground repair and the workover of wells, and the prestige of the repair profession can and must be raised.

During the Five-Year Plan, when the Azneft' Association collective resolves the most important problems of stabilization and growth of oil recovery and of radical improvement of the work of all oil-production teams, questions of strengthening labor discipline and raising labor productivity go to the head of the line. CPSU Central Committee General Secretary Comrade Yu. V. Andropov emphasized at the November 1982 CPSU Central Committee Plenum: "It is necessary to create those conditions--economic and organizational--that will stimulate labor, initiative and enterprisingness....The fight against any violations of party, state and labor discipline should be conducted decisively." These words are of great importance for Azerbaijan's oil industry.

A great reserve for increasing labor productivity and the amount of oil and gas recovered, improving the status of drilling and construction work, and, in

the final analysis, providing for the fulfillment of all our plans and of the socialist commitments that have been adopted is concealed in a strengthening of discipline. And Azneft' Association oilfield workers have adopted high commitments for this year of the five-year plan: using internal reserves and speeding up the introduction of new capacity, to recover 10,000 tons of oil and 50 million m<sup>3</sup> of gas above the plan and to provide for 40,000 rubles of above-plan profit.

The competition to implement the decisions of the 26th CPSU Congress and the 30th Communist Party of Azerbaijan Congress, the November 1982 Plenum of the CPSU Central Committee, and the instruction of CPSU Central Committee General Secretary Yu. V. Andropov, which are being widely promoted in all oil-and-gas recovery, drilling and construction administrations, will help to fulfill this strenuous program and to strengthen labor and production discipline. In the vanguard of the competition are Heroes of Socialist Labor toolpusher Akif Amanov from the Ali-Bayramli UBR [Drilling Administration] and Salman Nagiyev from the Gobustan UBR, Foreman Alesker Mamedov from the Kyursangya UBR, oil-recovery foremen R. Ragimov from the Karadagneft' NGDU, A. Kuliyeu from the Sal'yaneft' NGDU and R. Kuliyeu from the NGDU imeni 26 Bakinskiy Komissarov, and others.

Azneft' oilfield workers are filled with resolve to carry out the party's decisions and to implement the words of Azerbaijan Communist Party Central Committee First Secretary K. M. Bagirov about a rebirth of the former glory of the republic's oil industry and about insuring in the next few years a radical break in the work of the oil and gas recovery industry.

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KASPMORNEFTEGAZPROM DISCUSSES UPCOMING TASKS

Baku AZERBAJDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 6, Jun 83 pp 1-5

[Article by K. A. Abasov, chief executive officer, Kaspmorneftegazprom All-Union Production Association: "Tasks of the Kaspmorneftegazprom All-Union Production Association in Light of the Decisions of the November (1982) CPSU Central Committee Plenum"]

[Text] The people at the Kaspmorneftegazprom VPO [All-Union Production Association], just as the entire Soviet people, in an atmosphere of strong labor and political enthusiasm, have taken up the campaign to implement the decisions of the November (1982) CPSU Central Committee Plenum.

The results of the November (1982) Plenum and the tasks proceeding from its decisions determine the specific ways to solve the key problems of the economy, to speed up technological advance, and to improve the quality of all work performance.

Problems pertaining to development of deep-water Caspian offshore oilfields are being solved in this association in a purposeful manner. The search is continuing for new oil and gas deposits in the Azerbaijan and Turkmen sectors of the Caspian Sea, as is work on delineating earlier discovered pools.

Following an extended interruption, exploratory drilling has been resumed in the B. Andriyevskogo, Peschanny-More, and B. Livanova-Vostochnaya areas. Oil and gas saturation has been established in producing zone VII of the PT in the far southeastern periclinal part of Bulla Island. The oil pool outline has been expanded for the pool in producing zone VII of the Sangachaly-Duvanny-More-Bulla Island field, the gas condensate pool in producing zone VIII of the PT in the Sangachaly-Duvanny-More-Bulla Island field, and the redbed gas condensate pool outline in the B. IAM field. Plans call for stepping up prospecting and exploration of highly-promising structures -- Kaverochkina, B. Andreyeva, where work has now begun.

Discovery of the Field ineni 28 April is the most important result of prospecting and exploration work on the Caspian in recent years.

Testing of zone X of the Balakhanskaya formation of the PT in Well No 4, at depth interval 3,433-3,423 m, produced a flow of crude at a rate of 300 t/day through a 9 mm diameter choke with  $p_{\text{buj}}=10$  MPa, which indicated the discovery

of a new oil pool. Subsequently testing of the "discontinuity" series in Well No 6 produced a flow of crude, revealing a new oil pool in this structure. Subsequently Well 7 went into operation from this platform.

In 1983 Well 5 on the northeastern flank, drilled at a sea depth of 110 meters from a PPBU [semisubmersible drilling rig], produced flows of crude from structures in the "discontinuity" series and zone X of the Balakhanskaya formation, thus proving the presence of oil and gas on the northeastern limb of this fold. This same year two other exploratory wells went into production, wells which had been drilled from Platform No 2, positioned at a sea depth of 100 meters. Interesting data has been obtained in Well 11, which is being drilled from PPBU "Shel'f-1." Zones VII and VI of the Balakhanskaya and NKP formation are oil producing here, in addition to those which had already been discovered.

The results of prospecting and exploration activities enable us to schedule for the end of the 11th Five-Year Plan start-up of commercial production in the multiple producing zone Field imeni 28 April. The potential of this field is indicated by the fact that the dimensions of the fold are rather large, and it is capable of containing a substantial number of production drilling locations.

Complex technical problems must be resolved in providing this field with facilities. The basic direction being taken in resolving these matters is execution of engineering-technical measures making it possible to build offshore structures at sea depths of 100 meters and more. The problem is dictated by the necessity of tapping promising new oil and gas bearing structures located in areas where sea depths run to 200 meters at the first stage of development of new areas and at depths in excess of 200 meters in the following stage. Construction of fixed platform No 2 for a sea depth of 100 meters has been accomplished on a design developed by Gipromorneftegaz, and platform No 3, for a sea depth of 110 meters, is being erected, supported on leg units with positive buoyancy and modular platform structures. The floating platform support, which can be towed to any sea location and then tipped to a vertical position, is a major technical engineering achievement which is of decisive significance in solving the complex problem of building deep-water platforms.

In order to pump production ashore it was necessary to solve the technical problem of laying a pipeline from the special laybarge "Suleyman Vezirov."

All engineering-prospecting work preparatory to installing deep-water fixed platforms and semisubmersible drilling rigs is accomplished from a special drillship with a modern marine riser system.

In connection with the discovery of deep-lying hydrocarbon deposits, there has been a considerable change in conditions of well drilling and operation, connected with the great depths (5,500-6,000 m) of producing zones. Reaching great depths has required the adoption of sophisticated deep-well drilling equipment and techniques, as well as new, highly efficient rock cutting tools. The great depths have dictated the need to devise and adopt a well drilling system which meets the requirements of drilling in conditions of high formation pressures and temperatures, wellbore casing and cementing, providing for running



in casing strings with small clearances, solid sealing of threaded connections, and high casing string strength.

In the area of oil production equipment and technology, work is continuing on further improving well production activities by adoption of gas lift valves of various modifications and automated gas-lift process control systems utilizing microprocessors.

Remote-controlled downhole safety valves as well as BOP stack safety shutoff valves are employed to ensure safe operation of offshore wells with high formation pressure.

Development of offshore fields has made it necessary to design and improve a product gathering, treatment and transfer system which provides environmental protection and shortens construction time by employing complete modular-unit installations with automation of handling processes.

The process of producing, gathering and treating natural gas in offshore fields is on the whole similar to that employed on land, but technical implementation of these processes at sea has its specific differences in connection with limited space available for installing well product primary processing equipment and the necessity of treating multiple-phase product in a single field.

A combined gas treatment system has been devised on the basis of adoption of Gipromneftegaz and the All-Union Scientific Research and Design Institute for the Gas Industry innovations and VPO Kaspromneftegazprom experience in operating gas gathering, transfer and treatment systems, which include the following: I -- separation directly at the wellhead, where droplet-form liquid brought from the well is separated from the gas phase; II -- through high, medium and low-pressure lines at the MNGSP [offshore oil and gas rigs]; III -- at onshore gas treatment facilities prior to entering the trunk pipeline.

Head-end unstable gas condensate treatment facilities and the Dashgil-Azerbaijan Gas Processing Plant condensate pipeline have come on-line, substantially reducing losses on propane-butane fractions, which are recovered at the plant during gas separation and stabilization of unstable gas condensate; thus a closed system of gathering, transfer, treatment and processing of gas condensate has been brought on-line.

And, finally, gas treatment and dehydration equipment is being installed at head-end facilities in order to feed into the trunk natural gas pipelines gas which meets the state standard.

The difficult conditions of oil and gas production in offshore fields require production automation and mechanization.

Work is continuing in a planned and orderly manner at VPO enterprises to incorporate automation of production processes and automated control systems employing computer hardware.

Since commencement of automation of Caspian offshore oil and gas production processes, 15 automatic and remote control systems have been installed in 13 oil and gas production departments, encompassing more than 900 wells.



A group data processing center has been set up, where four sets of problems are solved for the automatic control systems of the oil and gas production administrations imeni N. Narimanov, imeni Serebrovskiy, Artemneftegaz, etc.

At the Order of the Red Banner of Labor subdivision imeni 22nd CPSU Congress, construction and installation has been completed and start-up accomplished on a process automatic control system for gas-lift production of crude at TsUNG [expansion unknown] No 3, employing an Elektronika-60 microprocessor computer, which is presently controlling gas feed to gas-lift wells and is automatically measuring the crude oil flow rate from these wells. This system is also scheduled to be installed in the Oil and Gas Production Administrations imeni Serebrovskiy, imeni N. Narimanov, and others.

The specific combined scientific-technical program prepared on the basis of a proposal by VPO Kasporneftegazprom specifies designing and installing a system to monitor and control the processes of drilling offshore wells, oil and gas production on the continental shelf, systems for automating offshore facilities, oil and gas production on a fixed platform, based on microprocessor equipment and other means of automation, with the country's leading scientific research and design institutes involved in developing these systems.

Utilizing the capabilities of VPO Kasporneftegazprom and catching up after a prolonged period of lagging behind targets, the crude oil and gas condensate production target for the first five months of 1983 has been met by 100.1 percent.

The gas production (102.6 percent) and delivery (102.5 percent) targets have also been overfulfilled. The well completion and reactivation target has been substantially overfulfilled.

Volumes have been expanded on adoption of such methods of enhanced recovery as in-situ combustion and flooding with surfactants and polymers in the Artem Island, Neftyanyye Kamni, and Sangachaly—Duvannyi—more—Bulla Island fields. Experimental-commercial production has been initiated at the imeni 28 April field; there has been an increase in the number and improvement in the effectiveness of geological-technical measures. As an aggregate these measures have produced excellent end results.

The product sales target has been met by 102.3 percent, with 5.1 million rubles in above-target sales. The gross output volume target has also been met by 101.4 percent, with industrial enterprises meeting their labor productivity targets.

State certification for the Seal of Quality has been successfully completed, and certificates have been received, awarding the State Seal of Quality to two product designations produced at the Azerbaijan Gas Processing Plant: stable casinghead gasoline, and propane-heptane fractions.

In response to the decisions of the CPSU Central Committee Plenum, the association's workers are planning to commence deep drilling in 1983 in the Area imeni Kaverochkin and the Zapadno-Okaremskaya area, to produce above target 15,000

tons of crude and 400 million cubic meters of gas by improving oilfield development procedures, by extensive adoption of advanced equipment and processes, and by accelerated movement of production facilities on-line, as well as to process 100 million m<sup>3</sup> of gas and to sell 700,000 rubles worth of product, achieving an above-target volume of production bearing the State Seal of Quality.

Measures further to improve employee working and living conditions are being carried out on the basis of implementing the comprehensive workforce economic and social development plan. The consolidated comprehensive plan for improving industrial safety and health conditions calls for spending more than 960,000 rubles for these purposes. Some changes have been specified for the first quarter pertaining to completing housing for occupancy.

Existing reserve potential, however, is being inadequately utilized. A number of drilling organization and the VPO as a whole are failing to meet drilled footage targets.

Successful accomplishment of the tasks assigned by the 26th CPSU Congress requires improved performance by scientific research, design and engineering organizations in the direction of boosting the level of research, formulating fundamentally new and original solutions, as well as prompt, timely and accelerated practical implementation of research and development results.

Among the problems which the institutes are working on today, the most important are projects involving performance of a number of tasks connected with the comprehensive specific scientific and technical program ratified by decree of the State Committee for Science and Technology and USSR Gosplan on developing and bringing on-stream the technical means of drilling offshore oil and gas wells at water depths up to 300 meters, development and manufacture of an aggregate of equipment for building offshore oil and gas field facilities, etc.

In addition to the above items, other problems are also being solved, which will make it possible to perform Caspian deep-water drilling, to improve oil recovery from producing formations, and to improve drilling and oil and gas production equipment and processes.

Proceeding from the decisions of the 26th CPSU Congress, the November (1982) CPSU Central Committee Plenum, and the instructions of CPSU Central Committee General Secretary Comrade Yu. V. Andropov on the matter of priority development of the fuel and energy complex, stepped-up oil and gas prospecting and exploration is one of the most important items for the long term. Toward this end, plans call for stepping up oil and gas prospecting and exploration in the areas of the Baku and Apsheron archipelagoes, on highly promising structures, where hydrocarbon reservoirs are believed to be located at depths down to 6,000 meters and more with high and abnormally high formation pressures. This requires solving problems pertaining to perfecting and building deep-water platform structures, large-scale advance to considerable water depths, development of equipment and processes for drilling to deep-lying producing formations, an aggregate of equipment for operating, studying and repairing oil and gas wells with seabed wellheads, construction and repair of pipelines at considerable water depths, design and adoption of flexible product lines, solution to the problem of electric power supply, etc.

Work being done by VPO Kaspornftegazprom pertaining to explaining and implementing decisions of the November (1982) CPSU Central Committee Plenum is being closely coordinated with priority development of the fuel and energy complex, which is one of the most important program tasks advanced by the party at the present stage, implementation of which will enable us in the very near future to place in the service of the homeland new and promising Caspian offshore oil and gas fields.

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## OIL AND GAS

### ALIYEV DISCUSSES AZERBAIJAN'S OIL REFINING AND PETROCHEMICAL TASKS

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 6, Jun 83 pp 5-8

[Article by N. M. Aliyev, minister of the Azerbaijan SSR oil refining and petrochemical industry: "Problems of Development of the Oil Refining and Petrochemical Industry of the Azerbaijan SSR in Light of the Decisions of the November (1982) CPSU Central Committee Plenum"]

[Text] The November (1982) CPSU Central Committee Plenum, which examined and approved the draft State Plan of Economic and Social Development of the USSR and the USSR State Budget for 1983, has constituted an enormous mobilizing and inspiring factor in this country's subsequent economic and social development. The proceedings of the CPSU Central Committee Plenum and the adopted decisions reconfirm our party's faithfulness to the basic policy elaborated at the 26th CPSU Congress and the firm resolve on the part of the party's Leninist Central Committee to continue implementing this policy for the sake of strengthening our homeland's economic potential and defense might, for the sake of strengthening the peace and security of peoples. A content-filled speech was presented at the Plenum by CPSU Central Committee General Secretary Comrade Yu. V. Andropov, in which he presented a comprehensive analysis of party and government activities pertaining to implementing the program of further development of this country in the 11th Five-Year Plan, specified by the 26th CPSU Congress, and stated specific, primary tasks pertaining to improving production efficiency and boosting the living standards of the Soviet people. Noting the particular importance of successful accomplishment of the 1983 economic and social development plan for the five-year plan as a whole, Comrade Yu. V. Andropov directed the attention of party, soviet, economic and public organizations as well as workforces to the necessity of focusing all efforts on accomplishing the highly important task advanced at the 26th CPSU Congress -- increasing intensification of societal production and improving efficiency of the nation's economy. Taking on importance in connection with this is maximum utilization of existing capabilities for improving economic management activities, accelerating scientific and technological advance, labor productivity growth, increasing output and improving product quality.

Azerbaijan's petroleum refinery workers, accepting as an unswerving guide to action the decisions of the 26th CPSU Congress, the 30th Congress of the Azerbaijan Communist Party, and the November (1982) CPSU Central Committee Plenum, have achieved definite success in achieving state plan targets pertaining to the



principal technical-economic indices and have put out a work performance without lagging enterprises. The 1982 industrial output and product sales targets were met by 100.1 and 100.3 percent respectively.

With a decrease in refining volume in comparison with 1981, industrial output volume remained at the 1981 level. In 1982 there was an increase in product yield per ton of refined crude, and the percentage share of product bearing the State Seal of Quality was 45.1 percent of total production volume in 1982.

In view of the fact that the main indicator of efficiency of the economy is labor productivity, the 11th Five-Year Plan calls for boosting labor productivity by 13 percent for the Azerbaijan SSR Ministry of the Petroleum Refining and Petrochemical Industry, with 6 percent to be achieved by improving management.

In the first two years of the five-year plan labor productivity has been boosted by 6.4 percent, including 2.6 percent due to adopting measures to improve management, generating a savings of 606,000 rubles.

Substantial savings in energy resources were achieved in 1981-1982: 57,400 tons of standard fuel, 263,800 Gcal of thermal energy, and 43.8 million kwh of electric power.

These successes have become possible thanks to rapid-timetable construction and movement on-stream of a number of high-output, high-productivity industrial installations representing the latest advances in Soviet and foreign science and technology, such as the following: ELOU-AVT primary crude oil refining units, units for catalytic reforming of low-octane gasolines at the NBNZ [Novobakinskiy Oil Refining Plant imeni Vladimir Il'ich] ELOU-AVT and lubricating oil hydrotreating units at the Baku Oil Refinery imeni 22nd CPSU Congress, large facilities for receiving crude from barges and bulk plant facilities for truck-distributing light refined products outside Baku, as well as due to efforts at intensifying operations at existing production facilities by equipment retooling and upgrading. For example, refrigerator-condensers and barometric condensers have been replaced by air-cooling units on a number of installations at NBNZ imeni Vladimir Il'ich, the heat utilization system has been improved, and obsolete compressors have been replaced with modern, high-output compressors on the catalytic cracking units and gas fractionating units. In order to provide catalytic cracking units with charging stock, ELOU-AVT unit No 16 is being equipped to refine low-sulfur crude. At BNZ [Baku Oil Refinery] imeni 22nd CPSU Congress, work has been done on renovating primary crude oil processing unit No 201, with adoption of modern process and equipment. Similar work will be done in 1983 on a second unit of the same type, No 202. A unit for the manufacture of IKhP-101 alkyl-phenol additive has been equipment-modified at the Sumgait Additives Plant.

Shutdown of the thermal cracking shop at BNZ imeni 22nd CPSU Congress is an example of combined solution to problems of improving production efficiency, boosting labor productivity, reducing material and fuel-energy expenditures, and increasing work loading on existing facilities.

With the occurring underloading of type 1-A/1M catalytic cracking units with low-sulfur charging stock (vacuum distillate), a substantial quantity of residual oils was being sent to thermal cracking. Low-grade unstable gasoline



was being produced, as well as kerosene-gas oil fraction for pyrolysis, which was sent to the Baku Neftegaz Plant. Residual oil yield was running 50-52 percent.

In order to eliminate these deficiencies, it seemed advisable to shut down obsolete and worn-out thermal cracking units. The plan was as follows:

to achieve, while retaining the production volume of high grade residual oils at the 1981 level, full utilization of the output capacity of vacuum distillation unit No 42, and by this to increase vacuum distillate available for catalytic cracking, and to increase the loading factor on 1-A/1M units to 81 percent;

- to boost labor productivity by 3-4 percent by eliminating 250 jobs;
- to reduce product manufacturing cost by reducing processing outlays;
- to boost the technological level and sophistication of production;
- to reduce air pollution.

At the present time, however, depth of recovery of light refined products remains inadequate, residual oil yield in petroleum refining remains substantial (50-52 percent), with a low volume of petrochemical feedstocks, and a number of products are qualitatively below the level of present requirements.

The principal directions for further improving the petroleum refining industry were specified at the October (1982) Plenum of the Azerbaijan Communist Party Central Committee, namely:

- deeper refining of crude by reducing furnace fuel oil output;
- improvement of the quality of lubricating oils;
- increase in feedstocks for petrochemical products;
- economical utilization of low-sulfur petroleum residues.

Specific measures have been formulated for all of the above, and the program of their implementation has been defined by party and government decrees.

In view of the planned increase in refining of high-sulfur crudes at the Baku refineries, with the objective of better refining, plans call for building a G-43-107 catalytic cracking unit with preliminary hydrotreating of vacuum distillate. This will make it possible to refine the crude more deeply: to increase yield of light refined products and to reduce furnace fuel yield. With this same objective, it is planned to renovate ELOU-AVT unit No 16, increasing its capacity, and refining of Buzachinsk crudes.

In order to achieve efficient utilization of low-sulfur tar oils of Azerbaijan crudes, presently being employed as a furnace fuel component, plans call for building a delayed-action coking unit, start-up of which will increase output of gasolines, liquefied gases and electrode low-sulfur coke.

In order to improve the operating efficiency of existing facilities, as well as to achieve further deepening of crude refining and increase available petrochemical feedstocks, plans call for loading secondary crude oil refining units to the rated level, as well as:

- increasing the output capacity of 1-A/1M catalytic cracking units;

- construction of a catalytic-cracking and coking gas oil extraction unit, to be used in diesel fuels;

- construction of a unit to produce oxydized bitumens of tar oils of high-sulfur crudes, which will make it possible to make up for the short supply of asphaltic bitumens of the Transcaucasian economic region, and will significantly reduce furnace fuel output;

- construction of a dual-flow AGPU [expansion unknown] for refining unsaturated gases from units presently in operation and in the process of renovation, and saturated gases from ELOU-AVT and catalytic reforming units;

- renovation of two existing sulfuric acid alkylation units (No 51, 52), increasing their output. A hydrogenation unit must be provided as a component of installations being renovated, in order to decrease sulfuric acid consumption.

Implementation of these measures will make it possible to boost refining of crude oil by 22-25 percent (in relation to crude refined at BNZ imeni Vladimir Il'ich), to reduce output of furnace fuels, to increase output of automotive gasoline, and also substantially to increase available petrochemical feedstocks.

One important task facing this republic's oil refining industry is that of improving the quality of lubricating oils produced. Toward this end we must modify the vacuum unit of the ELOU-AVT installation at BNZ imeni 22nd CPSU Congress to produce narrow oil fractions, as well as construction of a unit for in-process mixing of oils; a unit for selective purification of oils; a unit for propane deasphaltization of tar oil; a unit to manufacture IKhP-21 and IKhP-388 additives.

In connection with the steady decline in production volume of Azerbaijan lubricating-oil crudes and in order to retain the achieved output volume of lubricating oils, ensuring that their quality is at the level of the required state standards, it is suggested that one approach in a differentiated manner selection of stocks for manufacturing various types of lubricating oils.

Automation and mechanization of production processes and adoption of automated industrial process control systems should help achieve successful accomplishment of the tasks of boosting labor productivity and improving production efficiency.

A combined product quality control system was adopted in 1981 at BNZ imeni 22nd CPSU Congress. Work continued in 1982 on improving this system, and systems were installed at three additional enterprises: the Sumgait Additives Plant, the Baku Neftegaz Plant, and at the Commodity Production Office. A process automatic control system was installed on the ELOU-AVT unit at NBNZ imeni Vladimir Il'ich. Work has also commenced on installing a process automatic control system at BNZ imeni 22nd CPSU Congress, in particular a process automatic control system for the ELOU-AVT units, the lubricating oil hydrorefining units, and on selective purification and deasphaltization units to be built.

By its specific nature the oil refining industry is distinguished by a high degree of mechanization of labor in primary and subsidiary production. All refinery process units are totally mechanized. In order to achieve further increase in the degree of mechanization of labor in subsidiary-auxiliary sections, and particularly in refinery repair and maintenance services, these sections were data-documented in 1980, and a comprehensive labor mechanization schedule was drawn up for the 11th Five-Year Plan.

Accomplishment of the tasks facing this industry, in light of the decisions of the November (1982) CPSU Central Committee Plenum, requires increased aggressive innovativeness and initiative on the part of all oil refining industry workers.

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## OIL AND GAS

### RECENT DEVELOPMENTS AT OFFSHORE CHELEKEN FIELD DESCRIBED

Ashkhabad TURKMENSKAYA ISKRA in Russian 13 Aug 83 p 2

[Article by stringer B. Lebed': "Cheleken's Offshore Oil"]

[Text] Exploration for Caspian offshore storehouses began almost two decades ago. At first it was performed from trestles at sea, but now oil is prospected for at various shoals. Eight structures are being explored, says A. Tuva-kov, chief geologist of Chelekenmorneftegazprom [Cheleken Offshore Oil and Gas Production Association]. Industrial reserves of oil and of gas condensate have been established at five of them.

An analysis of oilfield geophysical studies of previously drilled holes in the Ogurchinsk area indicates the presence of gas deposits of industrial importance in the Akchagil'skly stage. Construction work to expand the platform for well drilling is now being performed here.

In recent years several promising structures on the Caspian's southeastern coast, which is adjacent to the Keymir-Chikishlyar oil and gas bearing region, have been discovered and prepared for deep drilling. Several offshore wells are being operated on Zhdanov shoals and the LAM, and new arterial pipelines have been put into operation, thanks to which offshore oil recovery has been greatly increased.

High flow rate well No 53, which was recently completed on the Zhdanov shoal, speaks eloquently about the prospects of the offshore structures. With its introduction into operation, daily oil recovery has increased by almost 90 tons at Chelekenmorneftegazprom and by more than 26 percent at offshore oilfield No 3. All this has helped Cheleken's oilfield workers to recover more than 1,500 tons of liquid fuel above the plan in July.

Today the Chelekeners are getting from the maritime storehouse a substantial portion of all the hydrocarbon raw material. With the introduction of new wells, offshore oil recovery will grow increasingly.

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## OIL AND GAS

### MUCH REMAINS TO BE DONE TO DEVELOP WEST KAZAKHSTAN OILFIELDS

Moscow IZVESTIYA in Russian 7 Sep 83 p 2

[Article by T. Mukhamed-Rakhimov, Deputy Chairman of the Kazakh SSR Council of Ministers and chairman of the republic's gosplan (Alma-Ata): "The Path to Caspian Oil"]

[Text] Put the underground riches of West Kazakhstan at the service of the national economy more quickly.

On an economic map of Kazakhstan, all its western part that abuts the Caspian Sea coast is marked by signs that indicate oilfields. During the last five-year plan alone, new symbols have appeared for oil and gas reserves in Aktyubinsk, Guryev and Ural Oblasts, in addition to Mangyshlak.

There is no need to prove the importance of developing West Kazakhstan's fields. Their proximity to refining sites and consuming areas and the presence of railroads, oil and gas pipelines, power lines and the reliable collective of explorers and recovery workers, who have good experience, that has taken shape over the years while developing Emba and Mangyshlak, will assure that this region's development will catch fire.

In accordance with 26th CPSU Congress decisions, a new and large oil recovery region is to be created in West Kazakhstan in a short time. Its composition will include the existing oilfield associations of Mangyshlakneft' [Mangyshlak Oil Production Association] and Embaneft' [Emba Oil Production Association], and those newly created at the recently discovered fields of West Kazakhstan. During this five-year plan, oil and gas recovery in this region should increase almost 1½-fold over 1980's.

Thanks to constant attention and assistance from the Kazakhstan Communist Party Central Committee and the republic's government, the geologists have stepped up prospecting appreciably. Since 1973 they have increased almost 10-fold the annual amount of drilling in the depths of the so-called subsalt sediments of the Caspian depression, which has enabled confirmation of their high productivity.

An achievement of Kazakhstan's geologists is the discovery of the Kenkiyak, Zhanazhol and Urykhtau fields in Aktyubinsk Oblast and the Karachaganak field in Ural Oblast. The wells in Aktyubinsk flow at the rate of 400,000 to



500,000 cubic meters of gas condensate per day--those near Ural'sk, 680,000 cubic meters. The fact that the sources of the valuable raw material are in direct proximity to the country's industrial centers should be conducive to their rapid development and economic yield.

USSR Ministry of Petroleum Industry explorers of the underground are extending great assistance to the search for oil in Kazakhstan. They discovered the new Tengiz structure, where flowing oil has already been struck, that is adequate for industrial development. And we must not reject consideration either of continuing deep prospecting in the Ustyurt area, the Buzachi Peninsula and Yuzhnyy Mangyshlak, as well as the waters of the Caspian Sea, where prospecting is being performed from floating platforms by Kaspornefteprom [Caspian Offshore Oil-Production Association] of the Ministry of Gas Industry.

For most of the newly discovered fields, complexity of geological structure and deepness of deposition--from 3 to 5 kilometers--are characteristic. Moreover, speaking the language of the geologists, the diversity and variegation of this region's structures are complicated by high hydrogen-sulfide contamination, which acts destructively on the equipment and subjects it to corrosion. So the pipe and the various instruments and tools needed for developing the new oilfields must be made from special alloys. We still have little of this equipment.

Comrade Yu. V. Andropov in his speech at the June 1983 CPSU Central Committee Plenum emphasized that enormous work awaits in the matter of creating machinery, mechanisms and technologies, as much so today as yesterday. Nature, as a rule, does not give us ready-made prescriptions, and usually the development of new regions poses some complicated questions to the pioneers.

West Kazakhstan is no exception here. The ministries of chemical and petroleum machinebuilding and chemical industry and dozens of other ministries and agencies have been given the task of mastering the series output of corrosion-resistant equipment and tools during this five-year period. Half of the five-year plan is behind us, but not by far has everything been done, and this is disturbing.

The production associations Aktyuneftegazgeologiya [Aktyubinsk Oil and Gas Geology Association] and Aktyubinskneft' [Aktyubinsk Oil Production Association] have been established for the rapid exploration and development of new fields. But even the appearance of such high-capability organizations does not at all mean that all the plans contemplated by the decree about the conquest of West Kazakhstan oilfields will be mastered on time. I think that everyone knows that this is new ground that is to be made habitable. This means first of all creating an environment for people: building housing, arranging for a water supply, which is very important in the steppe, and laying roads and power lines. I am speaking no longer about the buildup of the oilfield facilities themselves. Of course the oilfield workers, the geologists and the builders have not sat with their arms folded for all these years. Much has been done, but not everything by far. For example, in 2 years little more than 27,000 square meters of housing and 45 kilometers of roads have been built in these regions. Design work on the erection of a water reservoir at Emba and a pipeline from the Volga is being performed. These are important

hydraulic-engineering structures that are extremely necessary to the conquest of West Kazakhstan, but the job here is moving forward extremely slowly.

Roads are still another problem. And the most important of them are 350 kilometers in length, from the Zhanazhol field to the Kul'sary settlement, and 172 kilometers, from Kalankas to Tengiz, with a water-barrier across Komsomol'skiy Bay. Up to a million tons of freight will move over these roads of "life" annually. They not only will connect distant points with railroad yards, for purposes of developing the new fields, but they also will facilitate the task of further exploration. As for the embankment across the Caspian Sea's bay, it will become the shortest route between Mangyshlak and Guryev, and, moreover, it will protect against storm surges and enable oil exploration to be conducted on 8,000 very promising square kilometers.

Of course, assaults on new fields and the creation of settlements here are impossible without the development of the construction industry. The decree calls for all of this. However, in the meantime, the erection of housing-construction combines is being promoted intolerably slowly. Thus, for example, the capacity of the Shevchenko Large-Panel Housing-Construction Plant is to be rebuilt and increased through the oilfield workers funds. The work still has not started, although Minnefteprom [Ministry of Petroleum Industry] has sent 8 million rubles for this purpose. The deadlines for the design and construction of DSK's [housing construction combines] in Guryev and Oktyabr'skiy have not been met. The USSR Ministry of Construction of Heavy Industry Enterprises is delaying the erection of a reinforced-concrete structure department of 25,000-30,000 cubic meters capacity per year, although he must build it. Nonobservance by responsible and respected organizations of their commitments, which are of no little significance to the integrated development of regions for the country's needs, runs counter to the requirements of the November 1982 and July 1983 CPSU Central Committee Plenums.

The action parties upon whom fulfillment of 11th Five-Year Plan tasks depends are pointed out directly in the decree about developing West Kazakhstan's oil and gas industry. The work must be done earnestly and with a great feeling of responsibility, in order that this task may be completed by the deadline. All this is especially important when it is realized that the tasks that we are to resolve in West Kazakhstan are not at all confined to the mastery of these tasks at Tengiz, Zhanazhol and Karachaganak.

However, for this purpose, naturally, no few complicated questions that involve the most varied industries are to be resolved. It is necessary to develop not only the construction industry and power supply in rapid order but also advanced production technology. There is also much for scientists and designers to do. An increase in oil recovery in our regions will require priority solution of questions about scrubbing and refining the crude. This relates primarily to the problem of separating sulfur at the production facilities, which should be created in direct proximity to the sites of recovery.

The work that is to be done in the very near future is fairly complicated. It will be necessary to build new cities and settlements and to expand and furnish amenities for those already in existence. We have the forces and the

potential for this. An example of this is the integrated development of the Mangyshlak Regional Industrial Complex, the base of which today comprises not only petroleum but also chemicals and power.

We should fulfill our plans, as was said about this at the November 1982 CPSU Central Committee Plenum, not by incurring great expenditures but by skillful, rational work organization, savings of material resources, initiative in creative work and a proprietary attitude toward the national good. And it is necessary to show primarily high exactingness against any manifestation of negligence and lack of discipline from the very first step on the great and difficult path of the integrated development of the new oilfields.

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OFFSHORE DRILLING SHIP 'M. MIRCHINK' ARRIVES AT SAKHALIN

Moscow SOTIALISTICHESKAYA INDUSTRIYA in Russian 9 Sep 83 p 1

[Article by V. Volobuyev (Sakhalin): "At the Bottom of the Bay"]

[Text] The drilling ship "M. Mirchink," which came to the Far East from Murmansk--through four oceans, has begun work at Sakhalin Island.

"Our ship can drill in water up to 300 meters deep," says diving specialist M. Demchishin. "Not one drill rig on the island can even approach such depths. It does many jobs, and finding a 'window' that is described almost by the minute in the program is not simple." However, it was necessary to let divers down to the 100-meter depth. The fact is that a system of dynamic positioning, which is controlled by three computers, keeps the drill ship on its spot. And the hydrographic sensors, which must be changed from time to time, are installed on the bottom.

And now the time has come for a test descent. Demchishin is sitting at the panel. The deep-water diving complex has descended into the bay's dark waters. Without people, for now. At the underwater television screen is senior-mechanical engineer V. Smul'skiy. The bell has been lowered 100 meters. It is time for it to return--all systems are working normally. The divers were conversing quietly, and they are already dressed in their suits....

"At a 100-meter depth the lads will have loads on them such as, perhaps, not even the cosmonauts had," comments physiologist-surgeon V. Vaynshteyn. "The divers will walk on ground that is like open space. And the helium-air mix that they will breathe is so complicated that the slightest disturbance of the temperature program can cause supercooling. Incidentally, everything has been checked, and 'go' has been given for the experiment."

And now the bell has again gone into the deep. At each 10 meters the divers are asked how they feel. Figures indicating the depth, the condition of the gas medium and the temperature of the heater flash on the display.

The bell reaches the 100-meter level. It is time to equalize the pressure in it, to bring it into correspondence with the outside pressure. Slowly the hatch is opened, and the first to go outside is Yu. Kostenko. "I am pressurized," he reports. "Communications are good." The 1,000-candlepower lamps



help but little in the gloomy depths of the bay. Divers Yu. Kostenko and S. Shtangel' search for the hydroacoustic sensor practically by touch. There it is! Without superfluous words, the divers detach it. The helium-air mixture makes their voices, which come up from the bottom, sound like Buratino's speech. But the specialists have no time to smile. The sensor is disconnected from the platform, and now it is buoyant--one false motion and the instrument will fly from their hands like a bird. Well, it seems, it can go "homeward"--to the surface. Eighty...50...40 meters. A special grip receives the bell and the divers. However, it will still be 39 hours before one can meet the divers--they need to be decompressed.

"Now the 100-meter depth has become a working depth," says M. Demchishin. "And ahead is the next experiment. Authorization has been obtained to submerge to 200 meters. Then there will be permission to work at that depth."

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## OIL AND GAS

### STEPS TO CONTROL OILFIELD DAMAGE FROM AUGUST STORM ON CASPIAN DESCRIBED

Baku VYSHKA in Russian 5 Oct 83 pp 1, 2

[Article by Anatoliy Donets (Neftyanyye Kamni-Baku): "The Brave Ones Subdued the Sea"]

[Text] A report from where it happened.

On the morning of 16 August a storm warning arrived at Neftyanyye Kamni--a storm was approaching. And actually the wind was gaining strength by the minute, and already that afternoon, when Seyyad Ibragimov, director of the Oil and Gas Recovery Association imeni 22d CPSU Congress, was making his routine rounds, he saw that between drill rigs Nos 1021 and 1028 the waves were washing over the trestle, and, under the pressure of crashing 7-meter to 8-meter rollers, it was shuddering and sagging, as if it were a living thing.

It was then reported to him that waves had snapped the casing of the bore of well No 1635, and the dangers of a break in the christmas tree at its mouth and of an open flow of crude had arisen.

All measures for averting harm were quickly taken: firefighting equipment and plugging units were brought to the well by prime movers, and they managed to secure the well bore and hold it in a stable position. Then it was necessary to secure the bolted joints of the christmas tree, which had got loose as a result of the rocking--a powerful stream of gas and an oily film was spurting from it, and this did not allow units to approach the well: the slightest spark could have caused it to catch fire. And then....

Oilfield workers know well what occurs in such cases--at first a gas flare, and then break-off of the fixture, and then....a virtual flaming tornado.

The underground-well repair brigade under Arabal Kurbanov tried to prevent this eventuality. The oil-recovery foremen Azer Akhangli and Suad Dzhaferov, together with the brigade leader, got a grip on the christmas tree, which was shaking loose, and, at risk to themselves, tightened the bolts. The work required special care--a spark could come from the impact of metal on metal. And although they did not manage to seal it fully--the gas continued to push through somewhere--the stream of it had been greatly weakened, and this enabled the units to be switched on for operation. By 2200 hours they had managed to kill the well with water and mud.

...Meanwhile the wind had grown stronger. Each hour Neftyanyye Kamni's weather service sent summaries. The force of the wind, according to its data, had by this time reached 30 meters per second, and by 0100 hour on 17 August it was still gathering strength, the gusts reaching up to 35 meters per second.

Earlier, at 1900 hours, 16 August, at a production conference, a staff to deal with the possible consequences of the raging elements and three emergency brigades of repair mechanics, electric and gas welders, electricians and workers of other trades were created. They were in full readiness and deployed on Chvanov Island--a filled-in portion of Neftyanyye Kamni.

At about 0200 hours it became known that the trestle between drill rigs Nos 1021 and 1028 had begun to rock strongly from the waves' powerful blows. Oil and gas recovery operators Siradzh Dzhalilov, Ramazan Orudzhev, Nazim Israfilov, Meykhosh Gamidov and Dzhabid Manlov and emergency vehicle driver Fakhratdin Bayramov were still at drill rig No 1028 at this time.

It was 0325 hours when they completed the next round of the trestle. And at this time the first 80 meters of it had crashed into the sea, literally tens of meters ahead of the slowly moving motor vehicle, which was carrying people. As a result of the break of power cables, several short circuits occurred, one after another. The automatic protection is powerless in such cases, and, as a result of the overload, all four steam generators of the power station went out of operation. Neftyanyye Kamni was plunged into pitch darkness....

The telephone lines also were broken, along with the power cables, and two oil pipelines and a water line for maintaining formation pressure at the wells also broke off. Crude oil began to go to the sea....

On the other side of the break were 8 drill platforms with 76 wells and, in all, 6 oilfield workers.

Association chief Seyyad Ibragimov, who was supervising the emergency operations, communicated with the oilfield workers who were left on that side of the trestle and ordered closing of the central christmas-tree valves and covering of the oil collectors.

The work had to be done in complete darkness, literally by feel, above the sea, which was howling below them. However, in just 20 minutes, the six brave ones had covered over all the valves, and the oil stopped pouring to the sea.

The emergency brigades on that portion of the trestle that was adjacent to Neftyanyye Kamni acted just as responsively. Only here, in order not to stop recovery at the remaining wells, with a flow of 256 tons of crude per day, delivery of the fuel was transferred to oil-gathering station No 11, bypassing the separation installation, which was on the other side of the destroyed trestle.

It was observed simultaneously that gas, which at any minute could be transformed into an enormous torch, was shooting out of a gas pipeline that remained hanging above the break in the trestle--the pipeline over which gas was sent from the shore, from the Bakhar field for Neftyanyye Kamni's gaslift wells, under 32 atmospheres of pressure. The operators were ordered to shut

off the gas-pipeline valve. This was not easy to do, since they had to work literally by feel. But they also coped successfully with their job.

And although the storm continued to rage, and all around there was continuous rumbling darkness, the people were calm: sometime toward 0530 hours, before daybreak, the first things had been done that could have been done to prevent greater damage--they had kept the sea from being polluted and the escape of gas and they had saved crude from being lost....

No one was lost that night on Neftyanyye Kamni. Dzhafer Kasumov, chief of SMG-3 [Construction and Installing Administration No 3] of Azmorneftstroy [Azerbaijan Trust for the Construction of Offshore Oil-Industry Facilities], called it "terrible." And he is no novice at Neftyanyye. He came here after completing the construction school of the Azerbaijan Polytechnical Institute back in 1968. During this period of almost 15 years he had survived several stormy nights on the steel island. But this night he and his brigade of 20 men found themselves on offshore stationary platform No 4, which had been erected in the area of the Field imeni 28 Aprelya. The small buildings in which the construction workers had taken shelter were shaking. Some of them began to be moved toward the edge of the platform by the more powerful wind gusts, threatening to be thrown into the 120-meter depths. It was decided to weld them fast to the platform's metal structure. Despite everything, the people did not lose their self-control, they stood firm. They were on the platform for almost 3 days. Their provisions ran out. They recalled that 25 kilograms of flour had been stored in one of the storerooms for just such an event. There was salt and water, and they mixed them and baked biscuits themselves on electric hot plates.... On the morning of 18 August a helicopter dropped them produce and bread. And it was still another day before a new shift came to relieve them....

The stormy night was not easy either for the power-station workers. When the steam turbines stopped at 0330 hours, they tried to start them. By 0830, by the efforts of senior machine operators Tamet Rasulov and Yuriy Aleksandrov, control-panel attendant Eduard Arutyunov, repair mechanics Khanbaba Poladov and Mikhail Trushchelev and many others, two of the four steam turbine units were started. Chief engineer of the steam turbine power station Nikolay Puchinskiy supervised the work. The oilfield equipment of Neftyanyye Kamni received current and began operating.

However, the power workers encountered still another difficulty here. The storm was so strong that the waves had raised sand and fine cockle shells from the sea bed. The pumps drove this material, together with sea water, into the turbines for cooling. The machines' condensers had to be cleaned every 10-15 minutes, and for this purpose it was necessary to stop the turbines each time. They were stopped, cleaned and again started, alternately. This continued for all the following days. As a result of the constant stopping and starting and the overloads connected therewith, the machines' mechanical duty mode was violated--turbine blades "flew off" and breaks were caused in some boiler tubes. In all, the consequences of the emergency took 4 days to eliminate. But during all this time, power for the oilfield was fed constantly, although in a reduced amount, and the people--the repairmen and shift personnel--worked



without leaving the power station for 16-18 hours per day each, and many of them did not close their eyes once during the first 2 days after the emergency....

Not one enterprise of the association stopped work during the days of the storm, except for those few hours when the power was off. But even during this time, people did not desert their posts.

It was precisely during these days that work on a new, highly productive well, No 8, which was situated at a stationary offshore platform at the Field imeni 28 Aprelya was completed. Neither was it easy there.

Well completion had begun 15 August, on the eve of the storm that was breaking, with the descent of the oil-well tubing into the drilled well.

The association's specialists were making tests. Representatives of the testing office of Kaspormorneftegaz [Association for Caspian Offshore Oil and Gas Drilling] did the work. Attention to the well had been increased--according to the geologists' prognoses it promised to have a high flow rate, and, moreover, if this proved to be correct, it could give substantial growth to the oil and gas bearing area by opening wide the industrial reserves of the suite of a discontinuity and of the tenth horizon of the Balakhany suite and clarify many features of the petroliferousness of the underground depths in this Caspian water area.

Drillers of the brigade of foremen Muslim Gadzhimetov and Arkadiy Avanesyan had completed drilling of the well at a depth of 3,604 meters, 22 days ahead of schedule, when the storm was breaking out, and no one wanted to stop the work, although, according to existing norms, they could have done so completely--it would be a pity to lose the time and prevent introduction of the promising well ahead of schedule. Everyone did his utmost to help the sampling brigade--the foremen themselves, drillers Akhmed Babakhanov and Guseyn Ibragimov and derrick operators Surkhay Talybov and Buran Kerimov. Only when the wind reached hurricane strength and the pipes began to shake loose in threatening fashion, and, at the order of the association chief, was the work stopped.

But still the elements were beaten and time was won. On 23 August the well began to flow at a steady rate of up to 400 tons of oil per day. Thanks to a great extent to the efforts of those who had worked those days during sampling and startup, the oil-recovery workers made up for the shortfall that resulted when several wells that were on portions of the trestle in the Gryazevaya Mound area were left without utility-services support and were forced to be idle for several days, and they also gave 1,000 tons of crude oil above the monthly plan on the eve of their trades' holiday--Oil and Gas Industry Workers' Day.

But this was later on. During those stormy days and nights here at Neftyanyye Ramni, literally everyone worked at full output for days, without closing their eyes, under conditions which, let us say it straight, were extreme and, at times, involved no little risk.

At dawn on 17 August, under the force of the howling rollers, another 60 meters or more of the trestle in the Gryazevoy Mound area collapsed, and so the total breakage of the trestle now was about 150 meters. The only remaining one of the pipelines that feed high-pressure gas that was still intact sagged threateningly above the sea....

Soon a helicopter delivered to Neftyanyye Kamni Kasporneftegazprom [Caspian Offshore Oil and Gas Production Association] chief Hero of Socialist Labor Kurban Abbasov and his deputy. Arriving with them were the managers of Gipromorneft' [State Institute for the Design of Offshore Oil-Drilling Facilities], Azmorneftestroy, Kasporneftestroy [Trust for the Construction of Offshore Oil Industry Facilities in the Caspian] and representatives of Kaspnefteflot [Caspian Oilfield Fleet]. A staff for elimination of the results of the damage done by the elements was established here, to be headed by K. Abbasov.

In order to introduce inactive wells more rapidly and to support normal operation of the others, it was necessary first of all to restore two pipelines and a high-pressure water line for injection wells, an air line for automatic grouped metering installations, power cable and the cables of automated systems for controlling well operations.

The decision was made to lay underwater pipelines, since restoration of the trestle requires a fairly long time--about 3 months. Ashore, an order to prepare pipe of the required diameter, to weld pipelengths and to transport them to the site of the emergency was given.

The performance of these operations was charged to SMU-2 of Kasporneftegazstroy [Trust for the Construction of Offshore Oil and Gas Industry Facilities in the Caspian] and SMU-3 of Azmorneftestroy and a specialized administration for underwater engineering operations.

Everyone understood well the responsibility that had been placed on him for the success of the matter assigned. After receiving the order here, the brigades of Viktor Dubinin and Nikolay Lagovskiy were charged with welding pipelengths for the two oil pipelines and they were to secure them to the pontoons, for transportation to the place where they were to be laid. Everyone worked without thinking about the time, and welder Allakhguli Balagardashzade and mechanics Salman Geybatov and Pavel Pripishnyk distinguished themselves especially.

The pipelengths were assembled in the shortest possible time--work began at 0800 hours and at 2200 hours they had been placed on the pontoons.

Kaspnefteflot sailors accepted the baton. There were the small towing boats, on which petty officers Lev Vishnevskiy and Vladimir Klikushin towed the pipelengths away from the shore to the tug "Beshtau," and the latter delivered them to the crane ship, "Krasnyye barrikady," which then ferried them to Neftyanyye Kamni.

The crane ship "Taman'" also was pressed into the work. The sea was still very restless--the waves reaching heights of 2½ meters, yet the underwater-engineering workers can, according to existing regulations, operate only where

there is a maximum wave height of 0.8 meter. But time would not wait--idle time of the wells could lead to complications, and restoring them would require possibly weeks or months.

The risk was great, but there was still a feeling of personal responsibility for the oilfield's fate and for success in eliminating the damage. And the captain of the "Taman'," Vladimir Yegiazarov, gave the order to proceed to the place where the trestle had been broken. Laying of the pipelengths was started: they were brought to the trestle and connected to the pipelines line to which they had been laid.

The work had to be performed under difficult conditions. Because of the strong wave action of the sea, the soft coupling of the winch now and then broke down....The equipment was worked to its limits, and even wrenches were broken. People had to be on the alert at all times.

The work was done under the technical supervision of chief of the production section of the SUPTR [Specialized Administration for Underwater Engineering Operations] Fakhratdin Bunyatov, and erector-mechanic Vitaliy Mel'nikov, welder Rafik Ismaylov and many others acted with precision and coordination.

The crew of the divers-support ship "Uronos-5" performed a great and important part of the work. Divers Viktor Podchernin, Anatoliy Puchko and Viktor Zima installed and attached taps from the underwater portion of the pipeline to the trestle. The divers of another ship--divers' support boat "12/17"--Ivan Fundeyev, Vladimir Sestrovatovski and others carefully traced the oil pipeline that had been laid on the bottom--there were no breaks, bends and so on. The underwater oil pipelines were pressurized to 150 atmospheres, and by 0200 all 76 wells had been started up and the crude was flowing along both strands of the oil pipeline. All these operations were performed in record time--about 30 hours in all.

Then an underwater gas pipeline, a high-pressure water line and still another, the third, strand of oil pipeline were also laid.

"This was truly heroic work, performed by people who were brave and bold and capable of countering the elements with their will and skill," said Kaspmer-neftegazprom Association chief Hero of Socialist Labor Kurban Abbasovich Abbasov later, during a meeting. And who, if not he, who has given offshore oil recovery more than 30 years of his life, would know the true value of this work, this confrontation with the elements.

Neftyanyye Kamni....Since the first days of the creation of this man-made island in the sea, man has opposed the elements here. In this confrontation with it he has gained experience and courage and has learned how to subdue its will. And the present-day generation of offshore workers has remained faithful to this tradition. The events of the stormy days and nights on Neftyanyye Kamni testify eloquently to this.

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## NON-NUCLEAR POWER

### INTERELEKTRO OPERATIONS DESCRIBED

Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 83 p 20

[Article by A. Linnik: "Interenergo: Reserves and Opportunities"]

[Text] At the Leningrad Production Association Elektrosila and at electrical equipment plants in Romania, Czechoslovakia and Yugoslavia the assimilation of a unified series of high-voltage asynchronous motors with a rated capacity of up to 1,000 kilowatts has gotten underway. Progressive design solutions, which were discovered by specialists from the CEMA participants within the framework of the international economic organization known as Interenergo, were used in developing this new series. The participants in Interenergo include Bulgaria, Hungary, the GDR, Poland, Romania, the Soviet Union, Czechoslovakia and Yugoslavia.

The new motors possess improved efficiency and a reduced materials intensiveness. They can operate at full load for a longer period of time than the older ones. In the USSR alone the adoption of the new electric motors will make it possible to conserve more than 900 tons of rolled ferrous metals, more than 3,600 tons of electrotechnical steel, some 140 million kilowatt-hours of electricity every year. The total national economic savings will exceed 13 million rubles. In the other participating nations the annual savings will amount to more than 300 tons of rolled ferrous metals, 1,000 tons of electrotechnical steel, and more than 200 million kilowatt hours of electricity.

Within the Interenergo framework there are some twelve agreements on multilateral international specialization and cooperation in the production of the primary types of electrical equipment, including electric motors, turbo- and hydrogenerators, large electrical machines, low-voltage equipment, cable and illumination engineering articles and others. The execution of these plans will make it possible to fully meet the needs of the national economies of the participating nations for many of the more important kinds of electrical equipment. The joint deliveries of specialized product for the years 1981 through 1985 will be three times greater than the 1976-1980 period.



The economical and rational use of costly and scarce metals has become one of the key requirements in creating the new series of electrical equipments within Interenergo. The adoption of the new series of power semiconductor units is providing a substantial savings of silicon, tungsten, copper and ferrous metals. There is a sharp drop in the use of materials in the low-voltage automated circuit breakers at currents up to 1,600 amperes that are now being developed.

Yet another standardized series of low-voltage asynchronous motors known as the AI "Asynchronous-Interielektro" motors are being put into production. The projected economic savings in the participating nations will be not less than one billion kilowatt-hours of conserved electricity per year. In addition, each year they will save 27,000 tons of steel, nearly 2,000 tons of scarce copper and 68,000 tons of pig iron. And these are not isolated examples.

Among the promising designs of Interielektro is the development of electrodrives for industrial robots (manipulators) and complete sets of electric drives for metal-cutting machine tools having computer numerically controlled units. The use of such electric drives in the machine tools will make it possible to reduce the use of metals and the weight of the machine tools, will improve the precision and quality of tooling articles and will ease the labor of the multi-thousand detachment of lathe turners, milling machine operators and polishers. Work is continuing on the development of sets of special production equipment for the manufacture of electrical equipment, which will make it possible to substantially raise labor productivity of the workers and to reduce the amount of space needed for production.

In order to promote the more successful solution of the food programs in the socialist nations Interenergo specialists have stepped up their work on the development of electrical equipment for controlling the technological processes for processing grain and automating and mechanizing the livestock farms.

There is no let up in the attention being given to the construction and operation of mechanized coal mines, ore enrichment facilities and other complexes of the CEMA member nations.

In using the advantages of the international socialist division of labor, the Interenergo participants have developed the large-scale production of many kinds of electrical equipment. But the reserves for improving efficiency have not been exhausted. On the current agenda is the coordination of matters having to do with eliminating parallelism and duplication of production facilities in certain nations, for deepening specialization and cooperation in the production of new products, and establishing direct production-technical contacts between the electrical equipment associations, enterprises and plants of the cooperating

nations. Significant reserves are to be found in the construction of integrated industrial facilities with the participation of the nations that have an interest.

The regular session of the Council of International Organization for Economic and Scientific-Technical Cooperation in the Field of the Electrical Equipment Industry, Interenergo, was held recently in Moscow.

Matters having to do with the further development of specialization and cooperation in the production of electrical equipment, organizing work on the joint planning of the production of selected kinds of products and the joint development of production capacities, and improving work in the field of standardization were examined.

Interenergo must accomplish extensive plans for modernizing electrical equipment and for improving their technical quality.

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## NON-NUCLEAR POWER

### PROBLEMS IN SUPPLYING OF CORRECT SIZE WOOD POWER LINE POSTS OUTLINED

Moscow EKONOMICHESKAYA GAZETA in Russian No 17, Apr 83 p 15

[Article: "Cubic meters vs. items"]

[Text] The correspondence of engineer S. Belyanina was published in EKONOMICHESKAYA GAZETA No 9 for 1983 under the above headline. The letter stated in part that the posts for rural power lines are required in small diameters of 18, 16, and even 14 centimeters in accordance with the standard designs for supports. But most posts arrive at the post impregnating facilities and construction sites in diameters of 20 and 22 centimeters. In comparing data on the parameters of the posts that have been received over the past three years, we find that approximately 2.5 million cubic meters arrive in accordance with the specifications of GOST 9463-72. At the institute of Sel'energoprojekt, they've concluded that almost every third tree (depending upon the cubic meter content) was cut down in vain. In response to this article the chief of the Administration for Supply and the Rational Use of Material Resources of the Timber and Cellulose and Paper Industry of the USSR State Committee for Material and Technical Supply, P. Reutov, has informed the editors that a new draft of the GOST for rough coniferous timber (to replace GOST 9463-72) has been developed. This document examines the dividing of posts into groups according to their intended purpose and a reduction in the thicknesses of the posts. The letter says that to strengthen control over the use of timber products it is advisable to organize among the customers a method for accounting of the receipt and expenditure of posts in number and cubic meters, since the specialized organizations for the repair and construction of power transmission lines have received the appropriate expenditure norms. The use of such a system of accounting makes it possible, in the opinion of the author, to use the posts more efficiently. The Chairman of the USSR State Committee for Prices, N. Glushkov, has informed the editors that to stimulate the delivery of timber products for the power transmission lines in small diameters the USSR State Committee for Prices feels that it is advisable to differentiate the existing wholesale prices depending upon the diameter and has asked the USSR Ministry of the Timber and Paper Industry (the primary drafter of the wholesale price drafts for timber products) to submit the appropriate recommendations. As we see, the problem is being solved. Unfortunately, the editors still do not know the position of the USSR Ministry of the Timber and Paper Industry since they have received no response from it. We hope that the ministry will find the opportunity to participate in the discussion of the problem that was raised by our reader.

## NON-NUCLEAR POWER

### KRASNOVODSKAYA TETS CONSTRUCTION REPORT

Ashkhabad TURKMENSKAYA ISKRA in Russian 29 May 83 p 1

[Article by G. Saparov: "The River of Electricity is to be Augmented"]

[Text] The rated capacity of the Krasnovodskaya TETS will triple as compared with the current capacity during the 11th Five-Year Plan.

The construction of additional power capacities on the shore of the Soymonov Bay has been in progress for nearly five years. This is an especially important year for the collective of the Construction Administration KrasnovodskTETstroy [Krasnovodsk TETS Construction Administration] and the various contract organizations that have been activated here. On 22 December, Power Workers' Day, the second power unit is to be put into operation.

Nonetheless, things are not proceeding well at this project which is so important for the western part of the republic. The figures offer little consolation: since the start of the year only 75.8 percent of the construction and installation work has been completed. The percentage of capital investment money that has been spent in May is even lower - 68.2 percent. The general contractor, the KrasnovodskTETstroy collective, is significantly behind in its work. It has been unable to handle half of the planned assignment for five months.

How can we explain such a lag in performance? Until quite recently the irregular delivery of raw materials and materials was cited as the main reason for the delay. And this was truly the way that it was. For example, they did a bad job of resolving the question of how to provide the construction project with preassembled reinforced concrete structures, which, of course, manifested itself in the slow pace of work of the general contractor. Consequently, there was no broad work front for the subcontractor organizations. The Bezmeir reinforced concrete articles plant was not motivated to ship its products on a timely basis since this was immediately



reflected in the time periods for completion of the electrical facilities for the subcontractor - the workers of the Sredazmontazh /Central Asian Installation Trust/ section.

Due to the lack of a work front in the first quarter such subcontracting organizations as Dagvzryvprom /Dagestan Explosives Industry/, Turkmentsantekhmontazh /Turkmen Sanitation and Equipment Installation Trust/ and the Construction and Installation Administration-1 of Turkmenkhimstroy /Turkmen Trust for the Construction of Enterprises for the Chemical Industry/ were unable to undertake their planned assignments.

The chief engineer of the KrasnovodskTETstroy Administration, V. Tsapurin, reports that "at present the main reason for the delay is a shortage of manpower."

In short, there is something to build, the materials to do the job, but no workers to do the work. But when the construction project was started and the additional power capacities were being developed it was entirely possible to foresee the number of workers that would be needed to do the job. However, at the All-Union Association Soyuzgidroenergostroy /All-Union Association for the Construction of Hydroelectric Power Stations/ there was little concern over this circumstance; and it was only when the construction project ran into difficulties that they suddenly thought to face up to the problem. But quite a bit of time was lost.

The departmental squabbling is making itself known. The ties between the builders and the designers of the project are weak. The project designers are the Central Asian Department of the Teplo-atomelektroproyekt /Institute for the Designing of Thermal and Atomic Power Stations/. There are no representatives from the institute at the construction site. For this reason many problems having to do with deviations from the design are solved very slowly.

The need to resolve problems arises quite often. For example, when installing a scaffolding the builders encounter rock which requires blasting. A simple question blossoms into a problem: it is necessary to coordinate with the workers of the Krasnovodsk section of Dagvzryvprom, who also need to confer with their superior administration.

This lack of a clearly defined system for solving problems does little to speed up the construction of this important project.

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## NON-NUCLEAR POWER

### POWER LINE CONSTRUCTION REPORT IN BURYATSKAYA ASSR

Moscow IZVESTIYA in Russian 22 Jun 83 p 1

/Article by A. Kleva, Izvestiya correspondent: "The LEP Moves Into the Mountains"/

/Text/ The Buryat ASSR has been linked with the Unified National Power System. The tractors belonging to the Vostoksibelektroset'stroy /East Siberian Electric Power Network Construction Trust/ have delivered the transformer substation to Bagdarin from Chita. Behind them are the slippery and mountainous roads of the taiga which cover a distance of 350 kilometers and the dozens of swollen rivers which had to be crossed.

This trip became the concluding chord of the mechanized column No 41 in the crossing of the Vitimskoye Plateau into the northern depth of the Buryat ASSR: until this day the mining Bauntovskiy Rayon remained the only area of the republic not connected with the national power system.

One year ago on the initiative of the deputies it was decided to clear a 166-kilometer cutting from Romanovka for the high-voltage power transmission line (LEP) using the peoples' construction project method; it was also decided to do all of the preparation work.

Every rayon resident responded. In the winter they passed over the bogs and lakes; in the summer they cut trees and uprooted cedars on the mountains and prepared the construction materials. The real possibility of providing current by the end of this year without tapping the resources of the BAM railroad came into being for the trust, which is the primary provider of electricity for the BAM. The task of completing this project was given to Column No 41, which is based in Chita. Here they carefully examined work progress and made adjustments to the plan. They recommended combining the forces of the workers of the region and the installation brigades and to switch the project on by some four months ahead of schedule - by the anniversary of the 60th year of autonomy for the Buryat ASSR.

The chief of the column, V. Parkhomenko, reports that "some 557 supports were installed during this time period. When the installers of the brigades headed by A. Derban, G. Titov and O. Shnurkov were unable to climb the cliffs, helicopters came to their assistance. The helicopters raised the masts and strung wire from the air. Foundation-less supports were used for the first time in the rocky deposits of the fields."

Today the Chita LEP builders are stretching wires on the outskirts of Bagdarin. On 1 July, the day of the Buryat ASSR holiday, they will connect this remote rayon center to the national power system just as they promised. Then there will be a new thrust. The masts of the power lines will march into the central lands of the state farms and into the settlements of the miners and construction workers of the mining region of the BAM area. In the north, near the site of the railroad construction project of the century, the Ust-Ilimskaya hydroelectric power station is already producing current. In a few years the Bauntovskiy Rayon will also begin producing a sea of inexpensive electricity for the BAM region. In Moscow and Leningrad they are preparing the documentation for the Mokskaya GES, which is to be the first hydroelectric power station in the cascade of the Vitim River. Following the completion of this power station this newly-awakened kray of hunters will begin to produce aluminum, to manufacture construction materials, extract ore and rare metals.

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## NON-NUCLEAR POWER

### SAYANO-SHUSHENSKAYA GES CONSTRUCTION REPORT

Leningrad LENINGRADSKAYA PRAVDA in Russian 14 Jun 83 p 2

/Article by M. Aleksandrov, scientific secretary of the Coordinating Council of Leningrad Enterprises and Organizations Participating in the Development of the Sayano-Shushenskaya GES: "The Contract is Binding: Checking the Status of Orders for a Major Power Industry Facility"7

/Text The construction of the Sayano-Shushenskaya GES is nearing completion. The seventh and eighth units of the Yenisey River giant are now being installed and next year they will produce power. In 1985 the final two units will be put on load. The power machine building organizations, Elektrosila and the Leningrad Metallurgical Plant, are already at work manufacturing the final power units.

In short, the Leningrad workers, participants in the "contract of 28", in which more than 250 Soviet collectives have played a part over the past eight years, have already completed the major part of what remained to be done to develop this major hydroelectric power station. It would appear that there could be no reason to fret and worry, however all of the most recent sessions of the office of the Coordinating Council of Leningrad Enterprises and Organizations Participating in the Development of the Sayano-Shushenskaya GES have taken place under somewhat strained circumstances. The talk is alarming, bordering on demanding and severe.

This can be explained by the fact that the participants are taking a truly state-oriented, caretaker approach to the business at hand. They are seeking to ensure that there are no hitches or misunderstandings at the very end, which might do damage to the very idea of the contract, except for purely economic losses.

Such was the purposefulness of the recent critique by the members of our council regarding the state of affairs with the production of the generator units (the KAG-15/75) at the Elektroapparat Association. The urgent need for such a critique arose in connection with the fact that the time has come to add up the results and that there is no 100 percent guarantee the equipment sets will be delivered to the power station on time.



It is well known that the rated capacity of the Sayano-Shushenskaya GES will exceed six million kilowatts. In order to handle such an "ocean" of energy and to transport it without losses through "rivers" of high voltage power transmission lines, it will be necessary to devise new equipment unlike that which was available for the Bratsk and Krasnoyarsk GES's. The first units of the power station have been put into operation. And for now they have managed to get by without this new equipment by using the regular, series produced VVG-20 switches. The construction preparedness and water level of the Yenisey have not made it possible to provide full load. But soon a temporary circuit will sustain an increase in GES capacity.

This is why it is so important to start the installation of the new equipment sets as quickly as possible. By the start of 1985 six out of ten of the new equipment sets must be at the power station. As of now there is none and the managers of the Elektroapparat Plant consider the figure six to be unrealistic. In order to fully appreciate the critical nature of the situation, we provide the following data: the lack of each of this minimal number of KAG's at the power station in May 1985 will represent a loss of 500 million kilowatt-hours of electricity.

What has led to such a situation that prevents an authoritative and experienced collective from being completely ready to fulfill such a crucial task?

It is important to clarify that Elektroapparat was to have manufactured the two first industrial models of the KAG back in 1979. The lack of a powerful test stand for the thorough checking of the technical solutions that had been selected by the scientists and designers was a major barrier at that time. It was truly impossible to get by without such a test stand since there were no similar equipment sets in existence.

To get around this barrier 16 labor collectives - the Leningrad cooperative participants pledged to use their own resources to build such a stand on the grounds of the Leningrad Polytechnical Institute imeni Kalinin. The cost of the work approached one million rubles and for this reason it was only in December of 1982 that the test stand was completed and the tests at last got underway.

And so it happened that this was the moment not only to test the equipment but also to check the persistence and determination of the electrical equipment builders. And the results were far from reassuring. It seemed that this extra time could have been used to carefully prepare the future production facility, for modernizing the sectors where the series production of the equipment sets was to be organized. But this was not done.

The metal workers and fitters from the brigade of Hero of Socialist Labor G. Ye. Kuznetsov, who were called upon to manufacture the basic assemblies of the experimental model and who were given the task of working on the first industrial model, can clearly demonstrate the conditions that were afforded them for this important work: maximum crowded conditions and the extremely low positioning of the crane equipment. It is amazing that they managed to accomplish anything at all. As to why they assembled the project some three to four times more slowly than usual, one can understand without commentary.

In the words of the deputy to the general director of the company B.M. Sushkov, it is now planned to modernize the assembly shop. But as to how quickly this can be accomplished remains an open question.

And there are quite a few such examples. Specialists from Elektroapparat still have not completed the installation of the experimental model of the equipment set on the stand at the Leningrad Polytechnical Institute. This is seriously delaying the carrying out of the full number of tests, is slowing the clarification of the design of the assemblies and parts, and, in the final analysis, is preventing the start-up of series production. The managers of the Leningrad Polytechnical Institute are not devoting enough attention to solving this problem.

Another example. The commercial service of the association has clearly not done enough work to provide the needed materials for the manufacture of the new equipment sets. Only now is it becoming known that not enough funds were allocated for rust-proof metal and that fiberglass for the outlets was delivered in limited amounts and of the wrong grade. Such problems at Elektroapparat are seen as insurmountable, offering the excuse that the All-Union Production Association Soyuztransformator did not render any assistance. Is this the only problem? A great many other proven means were not used. Even the experience of the cooperation of the "28" reminds us of some means: for example, the establishment of direct contacts with the collective and party organization of the enterprise-supplier.

And another problem, which in the opinion of the managers of the company is responsible for the fact that the collective does not have the forces to seriously undertake work on the order for the Sayano-Shushenskaya GES. This problem is that the association is compelled to work on two types of generator units at the same time - the KAG-15 for hydroelectric power stations and the KAG-24 for atomic electric power stations. To do this it is necessary to come up with completely different riggings, to ready the equipment in a different manner and to train people in a different way.

From the start it was clear that the burden on the shoulders of the collective was too heavy. This was made quite clear by the fact that the basic technical parameters for both equipment sets, as proposed by the customer, the USSR Ministry of Power and Electrification, were essentially alike. Here is the opinion on this score of corresponding member of the USSR Academy of Sciences and chairman of the laboratory at the Scientific-Research Institute on Direct Current, N.N. Tikhodeyev: "since the nominal currents for both equipment sets are almost identical, it was fully possible to make their designs identical. The level of unification of the units could reach 70 to 80 percent. It is odd that no one gave serious thought to this. Having decided to chase two rabbits at the same time, the enterprise put itself into a corner."

Are there any urgent measures that can be taken to overcome this miscalculation? Of course there are. And, by the way, the specialists at the high-voltage equipment laboratory of the Leningrad Polytechnical Institute imeni Kalinin, who are cooperating with the designers from the company, already have some ideas on this matter. For example, they propose changing the design of the KAG-15 disconnecting switch after significantly reducing the amount of labor required and making it possible to use it in the equipment sets of the second type. This is only half a measure, but it promises a substantial gain; however, at Elektroapparat for some reason they are in no hurry to work on these proposals.

This can be explained to a certain extent by the desire of the firm's designers to "have done with" their obligations and, finally, to provide the shops with the working blueprints for the equipment sets and to prepare data for estimating the material and labor outlays.

All of this is necessary, but it is just as necessary to look into the future to ensure that in two or three years they are not in such a poor situation as they are now.

These KAT-15's are not just two models that must be manufactured this year. They represent four out of the program for next year when another four units must be manufactured. It is naive to assume that this series and the series for the atomic electric power stations will be produced with the same success as long as there are two different designs. Bringing these designs into alignment depends upon specialists from Elektroapparat, the USSR Ministry of Power and Electrification and the USSR Ministry of the Electrical Equipment Industry, which as the customer and executor can come to a mutually advantageous and most economical solution.

In short, there are no problems that cannot be solved. The rapid completion of the preparation of the production facility, the persistent efforts to provide the continuous work of the conveyor that is being developed, and the determined steps that are being

taken to reduce the labor intensiveness and the unification of the different designs of the equipment sets - these are some of the things being done so that the collective can fulfill one of the final orders for the Sayano-Shushenskaya GES, which were proposed by members of the coordinating council.

The successful attainment of the goal will scarcely be possible without the effective monitoring of the course of events on the part of the company's party organization and without a skilfully organized socialist competition in the manufacturing shops. There is for now no need to talk about the use of these proven means.

Without doubt, the coordinating council will also do everything that it can to ensure that one of the members of our cooperative effort does a good job of handling the assignments that he has been given. This will require serious help from the All-Union Production Association Soyuztransformator, of which the firm is a part. The problem is that in the plan handed down to Elektroapparat the Sayano-Shushenskaya KAG's are being given a considerably more modest place than is necessary.

At the last session of the office of the coordinating council these words were expressed more than once: "the participants in this cooperative effort are nearing their primary goal. But until the Elektroapparat workers fulfill their duty the goal cannot be attained." To be more precise, if you will, one cannot talk about the situation that has evolved.

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## NON-NUCLEAR POWER

### BUREYSKAYA GES CONSTRUCTION REPORT

Moscow PRAVDA in Russian 16 Jul 83 p 2

/Article by S. Bogatko, special correspondent for Pravda: "The Second Star of the Amur River Region"/

/Text/ "Undertake the construction of the Bureyskaya GES"-- from the Basic Directions for the Economic and Social Development of the USSR in the Years 1981 Through 1985 and the Period up to 1990.

The water of the Bureya River is clear and pure, but in the shadow of the deep canyon the river's current seems black. Among the cliffs on the right-hand shore, appearing as a fortress wall, a thrown-together crib dam towers upward. Bound in iron below, it rises in ledges from the water to the height of a three-storey house. It looks like a decoration for a film on an historical theme. Against what kind of enemy must this mighty fortress be used in defence?

The chief of the SMU /construction and installation administration/ of the Bureyskaya GES, V. Shchuplyakov, explains: "It's our mooring wall. During the monsoon rains the river can rise by 8 - 10 meters in a single day, and then the barges can sail there. Now it is quite difficult to imagine what this can be like."

When I asked the local residents what the word "bureya" means, they came up with all sorts of hypotheses, but finally settled on one. Write down the word "violent", they said, and that will be justified. This advice did not seem too original since any mountain river can be called rapid and impetuous and even violent. No, it had to be compared with something a little more specific.

"You are seeking a comparison?", asked one of the leading engineer-designers of the hydrounit, V. Loshak. "Nothing could be easier. Compare it with the Yenisey River."

"You jest. Our readers will laugh. Any metaphor has to be measured: the great Yenisey River and some sort of Bureya..."

The engineer persisted, "You are doubtful for no reason. I am telling you this totally without any local vanity. On the contrary. You may recall the dramatic events surrounding the great flood of 1979 during the construction of the Sayano-Sushenskaya GES. On the Yenisey in the Karlovskiy Mountain range in one second approximately 10,000 cubic meters of water flew by; and here one must estimate about 16,000 cubic meters."

"It is hard to believe that the Bureya is mightier than the Yenisey."

"But that is the truth, although the force of the Bureya is only temporary: it rages and then calms down. In the winter, for example, the river barely moves beneath the ice. But during the rains it flattens everything in its path. Such is the nature of the Bureya, truly violent. To construct a dam such a nature is an inconvenience. But then there is more honor - the hydrotechnical complex will be useful for the power industry and for the entire national economy and for protecting nature herself: the forests and fields and the domestic and wild animals."

Yes, the summer and fall floods in the Amur River basin bring many problems. There have been instances when entire villages have disappeared without a trace. The Zeyskaya GES put an end to heavy summer flooding in the average flow of the Zeya River. A rich valley is gradually being developed. High upon the banks of the shore one can still see the remnants of the timber felling - the emergency moorings which are no longer needed. The Zeya River is now quiet.

And in other spots, including the valley of the Bureya River, the floods still cause damage costing millions of rubles. In the village of Novobureyskiy the water often inundates the plants and housing units. In the central square the waves lash and on such days the Rayon Party Committee runs things from a boat.

Thousands of hectares of excellent land are under constant threat and they cannot be sheltered like a city by a dam or earthen wall. Another tens of thousands of hectares of plowed fields are converted into impassable swamps when the Bureya River runs wild. In the meantime there is enough sunshine here to grow wheat, soy beans, tomatoes and watermelons. They even plant egg-plant here, a crop requiring a continuous period of warm weather. It is sad to watch how the trees are wrenched with their roots and carried down the river, including such valuable varieties as black birch, oak and the cork tree; or see Amur cork trees dragged over the rocks.

But nature has also created an excellent place, a ravine with strong sides, the Talakanskiy Range, where the impetuous strength of the Bureya River can be harnessed and converted into useful kilowatts. This is where the main GES of the hydrotechnical complex will be built. Six of its units with a total rated capacity of two million kilowatts will generate each year some seven billion kilowatt-hours of electricity. And only a narrow corridor will be subjected to flooding. Somewhat further down the river they will build one more "buffer" compensating GES with a rated capacity of 320, 000 kilowatts and an output of 1.5 billion kilowatt-hours.

The expression "useful" kilowatts is not strong enough for the situation that is developing today in the Far East. The shortage of electricity that will be met by the Zeyskaya GES will again become acute in two to three years. New enterprises, sovkhoses and housing units require energy. The electrification of the Trans-Siberian Railroad is proceeding at a rapid pace; and the areas adjacent to the Baykal-Amur Railroad are being developed. The yield of electricity from the future Bureyskaya GES is already scheduled by customer, as they say, "on the chit".

The fight for kilowatts is intense. Each economic manager understands that only electricity can help to achieve a substantial increase in labor productivity and to intensify production. The power limits are rigid and each claimant for electricity is scrutinized closely. Only one new customer is accepted by the dispatchers of the Unified Power System of the Far East without any argument, and even with impatience - Talakan. This is because this client requires large amounts of energy: the Bureyskaya GES will return millions of times more electricity than it uses.

The Talakanskiy Range just as the Zeya River gates is located between the BAM and the Transsib. From Novobureyskiy the railroad heads north into the Turan Mountains. When they intersect the path the masts of the LEP-220 power transmission lines move along the knolls of the mountains. The power line was turned on only recently - on the night of the New Year. Barges loaded with metal and heavy machinery and entire plants also move toward the north with the current of the Bureya River. Through these three transportation lines people, equipment and energy are being moved from the Zeya River to the Bureya River.

The first groups of construction workers came to the Bureya at the start of 1976, shortly after the first turbines of the Zeyskaya GES were put into operation. On the taiga shore the people raised tents and built houses, moorings, and warehouses and they cut a road through the cliffs. Without benefit of cranes at the start they had to use their heads to unload the parts of the heavy machinery. They broke slings, hurried and wanted to get the construction project underway as quickly as possible.

Although every worker who expressed a desire to go to the Bureya was warned about the difficulties that awaited them there, there was no shortage of volunteers. The builders from the Zeyskaya GES competed for the right to travel to Talakan. The people were ready for the frosts and the temporary lack of living facilities and for the hard work. But the chief difficulty was something else altogether. Questions having to do with designing and financing took too long to be answered. The extreme slowness and indecision were worse than any frost when it came to slowing each step. There was a sharp slump as the project became very unproductive and the "quiet progress" mode set in. Every question, which was normally answered quickly, became a problem.

Things became so bad that they became paradoxes. While living in the woods, the builders were always experiencing shortages of lumber. Meanwhile right next to them near the area of the future reservoir, it was going to be necessary to clear tens of thousands of cubic meters of wood just to clear the river channel. But one cannot act on his own, permission was required for everything and the designers did not rush to cut the contour. And then the manager of the work on the Bureya, V. Shchuplyakov, was informed by the finance organs that his signature on the documents was not real, that there was no such construction project and he had to prove that they were not fighting with the partisans and that there is a line in the decisions of the 26th CPSU Congress that concerns the construction of the Bureyskaya GES.

A true construction worker does not like to work at half strength. Many outstanding workers and specialists, veterans from Zeyagesstroy /Zeyaskaya GES Construction Trust/, left to work on the BAM, to the more fortunate hydrotechnical projects in the Ukraine, Central Asia, the Transcaucasus. The collective of Far Eastern hydroelectric power station builders, which had been created with great difficulty, came apart. Last year alone some 390 residents of tiny Talakan left, while 430 arrived.

But not everyone has left; and Talakan still managed to grow. And this year, when, at last, the ministry defined the amounts and time periods, it appeared that the minimal "fulcrum" had been created on the Bureya River. The "pioneer" settlement known as Vremenny /temporary/ was built; it now is home to more than 2,000 residents. There are stores, a club, a bakery, a school and a hospital. There is television, a branch of a school of higher learning, a vegetable storage facility, a hothouse and so forth. Much has been done in the way of private construction during non-duty hours on the basis of enthusiasm. Vremenny is the site of four large panel houses with all conveniences. There are also the wooden houses, of course. Repair shops, warehouses and garages have been started; roads have been cut in the range: and along the river and up toward the top of the future dam.



But this is not enough for the work to truly get underway. And the most important thing is that there is still a shortage of housing, meaning that Talakan is just like other previous construction projects. One must reluctantly conclude that if there are significant shifts in the equipment and work technology and if the quality of the engineering concept and work mastery goes up, then in the upper echelons of management and in such spheres as planning and financing, then little progress is being observed. What is more, if, for example, the start-up of the first units of the Zeyskaya GES took place in the eleventh year after the work was started, then on the Bureya this is planned for the thirteenth year and, as a result, the time periods for completion are expected to be even longer.

And has the overall situation really gotten worse? In 1963 in Amur Oblast there was almost no construction industry base, if you forget the small brick plants that operated on a seasonal basis and the sawmills. In the beginning the majority of the materials and structures had to be assembled and transported from throughout the Soviet Union to the Zeya. Now the situation has changed radically and not just due to the construction of a construction materials base for the construction of the Zeyskaya GES. A major complex of construction materials enterprises has grown up right next door - in Shimanovsk. Large enterprises have been created in Tynda, Blagoveshchensk and other cities of the Amur River area. And the weak system of Amurenergo that existed in the 1960's as compared with what we have today... How much more experience and knowledge the hydroelectric power station builders have now!

There is no need to shake our fists and point at what has been overlooked. But the Far Eastern hydroelectric power station builders are facing a great deal of work. The old mistakes will be repeated if the main questions are not answered. And primarily it is necessary to organize the planning and financing. In a government, where the plan is considered law, the planning organs must be given a lot of legal rights and must raise their personal responsibility for the quality of their decisions. Under normal financing and the providing for the same amount of money it would have been possible to complete the Zeyskaya GES several years earlier. And tens of billions of kilowatt-hours of electricity would not have been lost. One can estimate the losses in rubles and in tons of coal and oil.

As regards the designing, it would be a good idea to look to a historical experience. When the Red Army needed more improved aircraft, a competition was organized between the design bureaus. This would be a competition between the creative collectives. In short order the Soviet Union received several models of the highest quality. The creative competition did not play the final role, which is a powerful stimulus at all times. This procedure made it possible to avoid the arbitrary interference at the intermediate

stages since the evaluation is made only for the final product. The main contribution of the chief designers is that they searched for, found and put the most capable workers into the key posts.

Do we really have fewer talented engineers-designers now than we did then? But, apparently, the struggle against parallelism and duplication has gone so far that the designer-"monopolist" is accustomed to operating by "diplomatic", departmental concepts rather than by engineering concepts. Quite often the selection of personnel is done in the same manner.

The cost of the construction project as compared with the total amount of capital investments is not great; but the savings from improving the quality of the design can at times cover all outlays. This is in principle; but in practice the designers see many of the comments and recommendations as harmful to their self respect. It is dangerous to harm relations with a "monopolist", for he can think in this manner: "There are lot of you and I am alone. The more you argue the worse things are going to be for you. Time is running out and nobody but me will do the design."

The competition will help to shake him out of his complacency; but not a formal competition. Rather a truly creative competition that strongly motivates the search and daring, when only the best design receives the right to become a reality.

Enthusiasm is not an abstraction. This is a special kind of passion. A passion which one must know how to create and sustain. Enthusiasm needs effective organizational forms. If the designs were competitive, then society would receive a benefit from a competition among engineers. No matter how many brilliant concepts and decisions are lost in vain, they remain unclaimed and are sacrificed to departmental complacency. A creative competition can and must be organized even if only within the framework of the Institute for the Designing of Hydroelectric Power Stations and its regional subelements.

And what about those whose design is worse and will be rejected? Of course, it is annoying, but they must analyze their mistakes and reorganize.

The experience on the Zeya River has not been fully emulated. A new lesson learned on the Bureya River shows that time requires activization and the more energetic improvement of the system of designing and construction at all levels - from Moscow and Leningrad to the taiga settlement of Talakan, where today in the pangs of agony is being born a second and brightest star of electricity in the Amur River region - the Bureyskaya GES.

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## NON-NUCLEAR POWER

### KHARANORSKAYA GRES CONSTRUCTION REPORT

Moscow SOVETSKAYA ROSSIYA IN Russian 2 Aug 83 p 1

/Article by PRAVDA correspondent V. Orlov, Buryat ASSR and Chita Oblast: "Towards Energy for the Baykal Area"/

/Text/ "Complete the first two assemblies at the Kharanorskaya GRES and finish the construction of the Gusinozerskaya GRES" (from the Basic directions for the economic and social development of the USSR in the years 1981-1985 and the period up to 1990).

Near the eastern spurs of the Khamar-Daban Mountain range sits an enormous lake, 30 kilometers in length and five kilometers in width. The water in the lake is pure and transparent just like its neighbor Lake Baykal. Migratory flocks of geese have for centuries stopped here for a rest. This is where its name "Goose Lake" comes from.

It is not just its beauty that has drawn people to this lake. In the past century the Decembrist N. Bestuzhev found traces of coal here, described the riches of nature and predicted an important future for the lake. Soviet power has brought new life to the far Baykal region. In the first five-year plans they began mining coal and polymetallic ores and workers' settlements appeared. Construction was undertaken on a broad front. One of the key construction projects of the last five-year plan was the Gusinozerskaya /i.e., "Goose Lake"/ GRES.

Thirty years ago Fedor Andreyevich Bekher began this construction project with the first peg. He was the chief engineer of a construction administration. Now he is in charge of the organization. He describes with pride what has been done in this once-barren steppe, where earthquakes are common, the long winters can reach 52 degrees below freezing and the strong winds carry sand and dust. The residents came here from all over the Soviet Union, many of them without special skills. It was necessary to whip them into a strong collective, to entice them with the important task that they faced and to worry about their day-to-day needs.

To the credit of the party organization and the entire collective of construction workers, they have lived up to the task. In the kray, which for years was considered one of the most backward in all of the Russian republic, has appeared an energy base of its own. In the last five-year plan the first section of the Gusinozerskaya GRES with a rated capacity of 840,000 kilowatts was put into operation. The hearts of four of its power units are beating strongly, providing current to thousands of motors, machine tools, electric locomotives and lighting the lamps of Il'ich at the most remote shepherd's stopping place. While the Buryat ASSR once received electricity from outside its borders, now it is providing power to neighboring Irkutsk and Chita oblasts as well as to Mongolia.

The start-up of the new GRES has not only increased the reliability of the power supply for the Baykal region, but it has also brought good social changes as well. Next to the power station a city for the miners and power workers of the "Goose Lake" has grown up, with its own central heating system, water supply, and sewage system. The efforts of the power station builders alone are responsible for the construction of nearly 100,000 square meters of housing, kindergartens, a school, dormitories, a hospital, stores, and municipal and customer services institutions. All of this is the result of the persistent and conscientious labor of the engineers and working brigades which are headed by such leaders as G. Cantimurov, N. Barkov, N. Dragaylo and many others.

The Baykal area is intersected by the Baykal-Amur Railroad, which has opened up access to the rich deposits of copper in Udokana, the Kholodnenskiy lead and zinc deposit, the Molodezhnoye long-fibered asbestos deposit and to other underground treasures. The active development of this area, which gravitates toward the route of the century, was called for in the decisions of the 26th CPSU Congress. But a powerful energy base is needed for this. And in the Basic directions for the economic and social development of the Soviet Union it calls for an increase in the rated capacities of the Gusinozerskaya GRES and for the first energy to be obtained from the new Baykal region power station, the Kharanorskaya GRES, which is located in Chita Oblast.

The settlement of construction workers at this final station has been situated in the wide flood-lands of the Onon River. The white structures of completed units and that of structures being built are clearly etched against the green background of the steppe. Some 20,000 square meters of housing, a kindergarten, a dining hall, stores and temporary cleaning facilities have been built here. A boiler facility is being built, railroad sidings are being laid, a road is being built and work is underway on other production and consumer services' facilities. Everywhere you look there are young faces.



I asked the chief of the construction project, A. Tairov, "Are there many who wish to work for you?"

He reported that "in just this year we received several hundred such requests. And the majority of these requests came from young people. The youngsters gladly come here and are not afraid of the difficulties. They work harmoniously. They are starting families and studying. We have more than 100 men who are taking correspondence courses. Our young builders have come up with their own slogan, 'I am accountable to you, Yasnogorsk!'"

Several days later in Gusinoozersk the chief of the local construction administration, P. Bekher, complained, "Our people have nothing to do here. For all of last year, for example, our brigades were sent to various ends of the nation."

It was cleared up by the report that the problems and difficulties at both construction projects for Eastern Siberia have common sources. In the 10th Five-Year Plan during the construction of the first section of the Gusinoozerskaya GRES the Baykal residents noticed that the USSR Ministry of Power and Electrification and its main administrations Glavvostokenergostroy /Main Administration for the Construction of Power Systems in the East/ and Glavseverovostokenergo /Main Administration for the Exploitation of Power Systems in the Northeast/ are not overly worried about their concerns-- they support the construction of the production facilities and almost forget about the construction of housing and social and cultural buildings. They also have not thought about the development of a solid construction base in the Baykal area.

Such practice was discussed by the local party and soviet organs. The management of the sector agreed with the criticism and promised that in the 11th Five-Year Plan the errors would be straightened out. Unfortunately, time has not shown that the word of the responsible workers from the USSR Ministry of Power and Electrification is in unity with the actual status.

In 1985 one power unit is to be put into operation at both Yasnogorsk and at Gusinoozersk. The general contractor for the Kharanorskaya GRES is the Yuzhuralenergostroy /Southern Urals Electric Power Construction/ Trust. Sibenergostroy /Siberian Electric Power Station Construction/ is responsible for building the Gusinoozerskaya GRES. These subelements are sufficiently large to deal successfully with their assignment. But the problem is that both of these organizations are located several thousand kilometers away from their projects; one is in Chelyabinsk and the other is in Novosibirsk.

And here is the result. From the beginning of the five-year plan both construction projects have been behind schedule. In a period of two and a half years less than one fifth of the work on these key projects has been completed.

The collective of builders at the Gusinozerskaya GRES, numbering in excess of 1,500 men, can, for example, handle some 12 to 15 million rubles worth of work each year. Its plan called for them to complete substantially less than this amount. It has the capability to complete four million rubles worth of work in building housing units and social and cultural facilities each year; it is being allocated only one million rubles for these purposes.

By order of the minister of Power and Electrification they are to receive parts for four 45-unit apartment buildings from the Nazarovskiy Plant in Krasnoyarsk Kray. Practically nothing has been delivered. Also, the plants of the USSR Ministry of Power and Electrification last year failed to supply the power station with nearly 7,000 cubic meters of reinforced concrete and 630 tons of rolled metal. In view of their own problems, the builders had to scrounge from other construction projects. Their managers and specialists, who also left the construction site, exerted pressure in various cities and in the reception rooms of the suppliers. Disruptions in the supply of materials, a shortage of equipment and trucks are plaguing work in Yasnogorsk also.

The construction materials plant being built in Chita, which can produce 50,000 square meters of housing units per year and 30,000 cubic meters of reinforced concrete, holds great promise. It is to work for Baykal regional projects for the power industry. The enterprise has been under construction for several years. But as of today out of the nine million rubles of the estimated cost, only two million rubles worth of work has been completed. Last year the USSR Ministry of Power and Electrification published an order regarding the development of capacities for the production of reinforced concrete in the Baykal region and in Primorskiy Kray. According to the order by next year the plant is to be completed. However, work on this key project has not been backed up by either documentation or materials.

For the sake of fairness we must point out that the local organs are not devoting enough attention to these essential projects. For example, the Chita and Buryat oblast party committees have on several occasions passed decrees on how to adequately provide the builders of the power stations with local materials - brick, timber and claydite. However, these decisions have not been fully implemented. Year after year the Zabaykaltransstroy /Baykal Regional Transportation Construction/ Trust fails to meet their construction plan for secondary railroad tracks leading to the Kharanorskaya GRES. The office of the Chita Oblast Party Committee has repeatedly obliged the railroad builders to fulfill their planned tasks. But the situation has not changed. The Chita residents are in a position to render rapid assistance to the Yasnogorsk residents in the development of a housing fund.

It is felt that the local party organs will apply the same strict standards to the managers of the Buryatenergo and Chitaenergo administrations, which without the necessary responsibility are deciding matters having to do with designing and setting limits for the construction of housing and social and cultural facilities.

The Baikal region plays an important role in the national economy of the Soviet Union. Industry is being actively developed here and agriculture is being reinforced. Once railroad traffic is opened on the Baykal-Amur Railroad, the importance of the region will become even greater. For this reason it is imperative that the power industry be placed on a solid foundation.

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## NON-NUCLEAR POWER

### GUSINOOZERSKAYA GRES CONSTRUCTION REPORT

Moscow PRAVDA in Russian 27 Aug 83 p 1

/Article by M. Mikhal'kov, PRAVDA correspondent: "The 'Far' Construction Project"/

/Text/ In the socialist obligations of Chita Oblast an individual line reads: complete the construction of the Kharanorskaya GRES at a rapid pace. It is no accident that this construction project has been given so much attention. The completion of the power station will help to solve many economic and social-economic problems.

In the Lake Baykal region dozens of villages still receive electricity from autonomous and low-power diesel units. One can understand that this is delaying the comprehensive mechanization of labor-intensive processes and the social development of the collective and state farms. The start-up of the Kharanorskaya GRES is closely linked with the electrification of the Transbaykal Railroad. The energy of the Kharanor is impatiently awaited by many industrial and mining enterprises in the oblast. How are things going at the GRES construction project?

It has befallen a difficult fate. The first order of the USSR Ministry of Power and Electrification regarding the time periods for the construction came out five years ago. Laid out in detail and clearly defended it was approved in 1982 as a start-up project for the first section of the power station. The reality of what was planned led to no doubts: the ministry had more than once demonstrated its organizational readiness in the most distant and complicated construction projects. But things happened differently with the Kharanorskaya GRES. After three years the USSR Ministry of Power and Electrification, after apologizing, advanced the completion date for the first power unit to 1984. And recently the office of the Chita Oblast Party Committee examined the progress of the construction of the GRES and the draft of a new, the third to date, order of the USSR Ministry of Power and Electrification. According to this document, the completion of the first units of the power station are pushed forward another year. What is the reason for this "flexibility"?



First of all, the development of the social infrastructure is chronically behind schedule. And there is an acute shortage of housing and workers. Having emphasized the construction of production facilities, the USSR Ministry of Power and Electrification has missed an opportunity to concentrate the needed labor resources here, to pick up the pace of work, and to achieve success in key sectors from the very beginning. At present there is only one third of the needed number of workers at the construction site.

The ministry's decision to once again extend the completion date came as no surprise to the oblast party and economic managers. Everything had pointed to this happening. During the past years production facilities valued at about 17 million rubles have been completed. Some 70 million rubles for production-related construction plus 25 million rubles for the social and services projects and housing - this is what the two-year program looked like. How realistic is this program?

Past experience suggests that the USSR Ministry of Power and Electrification in the most acute situations can increase the pace of construction some five to six-fold and complete projects on schedule. Such was the case with the Ekibastuzskaya and Barnaul'skaya power stations. But to do this one must decisively overcome the delay and a solid link between the words of the headquarters and the actions of those to whom this task is given must be created.

In the final order of the ministry, which was signed by Deputy Minister P. Palaleyev, the extreme concern about the state of affairs was apparent. What sort of steps are being taken? For the temporary settlement the deliveries of prefabricated eight-unit apartment buildings from Bratsk were planned. This is an urgent matter for summer is the time for active construction work.

The chief of the GRES production administration, A. Tairov, reports: "Unfortunately, the order has not yet taken effect. The house-building structures still have not arrived from Bratsk."

The line in the order about the completion within one year of the construction of the secondary tracks and the intersite utilities can be viewed as a good intention. Some two million rubles were to have been spent for these purposes. The work is to be completed by the subelements of the USSR Ministry of Transport Construction. As we all know, one ministry cannot order another ministry. Agreements between the customer and the contractor are needed. The protocol is an order for all kinds of work and the total expenditures must pass through the planning organs. This is the established sequence for doing things. But there is no agreement between the headquarters of the sectors. How else can one explain that the Zabaykaltransstroy /Baiyal Region Transport Construction/ Trust did not receive the appropriate instructions from its ministry for

adding these projects to its list of assignments? The lack of agreement of administrative actions is already placing the reality of the new order under doubt, creating a lack of confidence and disrupting the sequence of the construction of the production facilities and placing the orders for the deliveries of the complicated equipment.

A session of the office of the oblast party committee, which was to have reviewed the progress of construction work on the Kharanorskaya GRES, was postponed several times. The oblast managers wanted to see representatives of the customer and contracting organizations required for making important decisions of rank. They, of course, invited Deputy Minister P. Surov, who was visiting the construction site. Taking into consideration that he is a very busy man, the date of the session was postponed several times, while trying to determine a "window" for the Kharanor concerns. But on the eve of the agreed-upon day for the session of the oblast party committee a report came that due to the fact that P. Surov was very busy he would be unable to fly to Chita. This led to a chain reaction, as a result of which workers with limited powers came to discuss the problem.

It is true that there was no shortage of promises and assurances this time. V. Vints, the chief engineer of the Yuzhuralenergostroy Trust, and A. Fuki, the chief engineer of the Glavvostokenergostroy trust, cited many comforting facts from the history of ministerial construction projects. But here is the characteristic trait for the Kharanorskaya GRES. The construction of a 240-meter smoke stack requires two years on the average. This takes into consideration whether the design of the main building is ready. But as of now there is no design. The representatives of the USSR Ministry of Power and Electrification were unable to comment on this situation.

A. Burdinskiy, a brigade leader for carpenters and concrete workers, has been at Kharanor from the very beginning. Quite a few of the builders who came here with him have left because they were convinced that the necessary order had not been established. But Burdinskiy feels strongly that he wants to see the GRES in operation.

The brigade leader says, "There is nothing to praise as of now. There are a lot of delays. And there are continuous shortages of blueprints and materials. But it is possible for things to change for the better at the site. There are the means to do this. It is only necessary for the managers of the USSR Ministry of Power and Electrification to face us, to roll up their sleeves, and to fulfill the pledges that they made to the collective."

Yes, the construction project in the Lake Baykal region is a long distance away and is apparently not too important in the overall balance of the ministry's five-year plans. It is felt that this is one of the main reasons for the slow-down in the construction work. The USSR Ministry of Power and Electrification must change its attitude toward the Kharanorskaya GRES. Particularly, since the moral logic of the word "debt" is materialized here in tens of millions of rubles waiting to be put to use in housing units, production buildings and power units.

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## NON-NUCLEAR POWER

### YOSHKAR-OLA TETS CONSTRUCTION REPORT

Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 83 p 9

/Article by V. Varavka, correspondent: "Who is Responsible for Deadlines?"

/Text/ They say that the second TETs, which is being built in Yoshkar-Ola, is covered in moss. The construction workers first appeared here, according to news reports, some six years ago. This is when the so-called preparation period began.

This period lasted some three full years. Then the actual construction of this project which is so essential for the city began. The pace of the work is about half of the norm. Some 46 months were set aside to put the first two sections into operation. More than 70 months have gone by and neither section has been completed.

The customer in the person of Glavtsentroenergo /Main Administration for the Operation of Power Systems of the Center/, headed by D. Protsenko, and the contractor in the person of Soyuzenergostroy /All-Union Association for the Construction of Power Systems/ (chief, N. Ivantsov) abandoned the SU-TETs /TETs Construction Administration/, which was working on the project, to the whims of fate: as if they did not have enough workers to do the job. And the construction administration never receives enough cement and metal. It frequently does not have the means for making estimates with the suppliers.

It comes as no surprise that in 1981 the assignment was fulfilled by only 77 percent and in 1982 by 69 percent. And for the first six months of this year the plan is only 40 percent fulfilled.

To straighten things out and speed up the work on the project, other construction organizations from the republic center have been called upon to help. Now these organizations must share with the SU-TETs the materials that have been allocated and send their own equipment and workers to the TETs. In short, the principle of "every little bit helps" has been implemented due to circumstances, which is detrimental to other construction projects.



What about the managers who are responsible? D. Protsenko and N. Ivantsov have washed their hands of the project in view of the unexpected assistance. They feel that work on the TETs will proceed without them. But things are not going well at the TETs. And the residents of Yoshkar-Ola would like very much for the USSR Ministry of Power and Electrification to explain its attitude toward the executive and planning discipline. And most important, they want to know when the long-awaited TETs will be completed.

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## NON-NUCLEAR POWER

### COAL DELIVERY PROBLEMS AT MOLDAVSKAYA GRES

Moscow GUDOK in Russian 1 Sep 83 p 1

[Article by GUDOK correspondent, M. Corbis: "Traffic Tie-up"]

[Text] Each morning the chief of the Kuchurgan station, O. Volkov, calls the managers of the Moldavskaya GRES and demands that they speed up the unloading of the cars loaded with fuel oil and coal. But he does not get the needed reaction. Then he sends alarming telegrams to the managers of the Moldavenergo power system. And again no results: the pace of railroad car unloading on the sidings of the GRES remains unsatisfactory. It becomes necessary to impose a double fine. But this does not help either. The loaded railroad cars are still delayed.

The disruptions in the unloading of trains at the Moldavskaya GRES have a very serious impact upon the operation of the entire railroad line. The power workers are obliged to free 215 gondola cars and more than 200 tank cars every 24 hours. In July and August the flow of trains carrying fuel increased sharply; but the pace of unloading has fallen significantly. This has meant that on the average for a 24 hour period they are managing to unload only 147 gondola cars filled with coal and 107 tank cars filled with fuel oil. At the Kuchurgan station there are from 110 to 220 gondola cars and from 100 to 160 tank cars waiting to be unloaded. It has become necessary to divert trains carrying fuel to railroad stations at Khadzhimus, Kaynary, Gidigich and Strasheny.

This alarming situation that has evolved with the unloading of fuel has prompted the management of the railroad line to send a group of specialists headed by chief engineer of the railroad V. Zelinskiy to the GRES. When they arrived they ran into a totally miserable situation. The GRES (director G. Kior) was totally unprepared for the increased volume of work. At the coal storage facility instead of 12 bulldozers, which were to have been put to work unloading coal, only five or six were actually at work. But even these frequently break down because of breakages. Out of the two car dumpers one was being repaired and the other is out of commission more than it is in operation. The power workers encounter a lot of difficulties in pouring the fuel oil. There are not enough tanks to hold it all.

The transport department of the GRES, the shunting locomotives, the equipment and tracks were in unsatisfactory condition. This, of course, has a negative impact upon the pace of unloading and will considerably complicate work when winter comes. At one time the transportation shop of this enterprise received the Challenge Red Banner of the Moldavian SSR Council of Ministers for its high work results.

What has happened? The ministries of the Coal Industry and of Power and Electrification, in striving to fulfill the plan for fuel deliveries, began shipping it to the Moldavskaya GRES in increased amounts. On some days they were shipping as much as 20,000 tons instead of the 12,000 to 14,000 tons. And the GRES was overtaxed.

I asked the deputy chief of Glavmoldenergo, G. Gapeyev, "What steps have been taken to undo the bottleneck?"

He replied, "We have sent telegrams to the all-union ministry asking that they reduce the shipments of fuel. But the situation still has not improved."

The problem is considerably complicated by the fact that the managers of the Main Administration of Power and Electrification of the Moldavian SSR Council of Ministers do not have a clear coordination of actions having to do with the distribution of fuel between sub-departmental enterprises. This has resulted in an excessive accumulation of railroad cars filled with fuel oil and coal on the Moldavian Railroad and to irrational transshipments. As recently as July and August some 540 tank cars of fuel oil were diverted from the Moldavskaya GRES to other enterprises. This, of course, has brought about disruptions in the operation of the railroad line and has reduced its throughput capacity. Calculations have shown that for these reasons the railroad has lost more than 5,000 railroad cars within a relatively short period of time.

As before Kuchurgan Railroad Station is jammed with railroad cars filled with fuel.

It is necessary to point out that the party and soviet organs in the republic and the management of the railroad are trying to give practical assistance to the power workers to speed up unloading operations. In the Railroad Administration the Chairman of the Moldavian SSR Council of Ministers, I. Ustiyon, moderated a special telephone conference call on this matter. Additional bulldozers have been sent to the Moldavskaya GRES, as has other machinery. Control over work progress for unloading fuel has been strengthened.

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## NON-NUCLEAR POWER

### BRIEFS

**EKIBASTUZ-BARNAUL POWER LINE**--The brigade of G. Ul'yanov from PMK-59 of the Tselinelektroset'sstroy Trust is installing the supports for the Ekibastuz-Barnaul electric power transmission line at a rapid pace. The experience that has been accumulated during the construction of the super-long-distance power lines is helping the installers to assemble the 40-meter overhead towers, which are comprised of enlarged sections, and raise them in 24 hours instead of the 36 hours for the norm. The brigade leader reports that the quickened pace was achieved by altering the technology for assembling and delivering the units in the largest size possible. Now the supports are installed in shop conditions in eight sections rather than in 20 sections as before. A large trailer has approached the next stake. The experienced driver, B. Plevako, has delivered it over a distance of 100 kilometers from the main base. In cooperation with the other innovators of the mechanized column he has designed a 20-meter length of highway, upon which the enlarged sections of the masts are secured for shipment. Previously one support was delivered to the construction site by five vehicles, which made two round trips per day. B. Plevako performs this operation by himself. For a non-standard size cargo, which is nearly the height of a two-storey house, a special route has been developed. Along the entire route wires have been raised which intersect the path, various utilities have been installed and smooth turns have been laid so that the trucks transporting the supports can "handle" them. For the first time there is a total of 11 men working on the project. During the construction of a similar line from Ekibastuz to Kokchetav the brigade that installed the mast was two to three times larger. They were able to reduce the number of men by cutting back on the amount of assembly work. The experience gained by the lead collective of the power line construction workers is being emulated by the installers from all four trusts engaged in laying the nearly 700 kilometer power transmission line. Each year the new power transmission system will send nearly 40 billion kilowatt-hours of inexpensive electricity to Barnaul. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 6 Mar 83 p 17 8927



CHANGES AT THE 'NORTHERN' GRES--To convert the "Northern" GRES into an energy and chemical combine of a sort is making it possible for an innovation proposed by scientists from the Azerbaijan Institute of Petroleum and Chemistry imeni M. Azizbekov to become a reality. On one and the same installation they are now not only softening sea water for steam boilers but are also separating valuable chemical elements from it. For the electric power stations that are located along the shoreline of the Caspian Sea, sea water that has been desalinated in the usual manner is used in an amount of hundreds of cubic meters every 24 hours. During the softening process a sediment with an increased saline concentration, which was mixed together in the sea, was formed. In order to not disturb the salt balance of the water basin, they decided to neutralize this solution. After a long search a decision was reached which at first seemed to be paradoxical. To avoid the harmful properties of the sediment one can separate from it such useful chemical products as magnesium oxide, sodium chloride and several other compounds with a high degree of purity. The water that has been purified is used again. The department head for water treatment, steam generators and thermal electric power stations of the institute, Doctor of Technical Sciences and Professor, K.M. Abdullayev, reported to Azerinform correspondent that the system for the comprehensive desalinization of sea water has made it possible for the GRES to expand its product. The receipt of chemical elements needed for metallurgy, the electrical equipment industry, for the pharmacological industry and the food industry is considerably less expensive on this new piece of equipment than by means of the traditional ways of removing these substances from the sea water. The new method is being adopted in Sumgait, where the proximity of thermal electric power stations and chemical enterprises will make it possible to efficiently use the compounds that are separated from the sea water. /Text/ /Baku VYSHKA in Russian 15 Feb 83 p 27 8927

ALMA-ATINSKAYA GRES--While generating electricity and providing heat to the settlement of Energeticheskiy, the Alma-Atinskaya GRES uses a lot of water. The existing method of purifying the waste water of oils and mazut in the settling pond is not being improved and so the waste water has for several years been released into the Malaya Almatinka River. The concentration in this river of petroleum products, as shown by analyses by the Iliyskaya sanitary and epidemiological station, exceeds the maximum permissible by 4 to 11 times. In 1977 they began to build a unit to treat the waste water of the GRES that had been polluted with oils and mazut with a projected productivity of 2,400 cubic meters every 24 hours. In concept, having passed through the unit, the water must be used again in the technological cycle of the electric power station without polluting the river. The standard amount of time for building such a unit is 19 months and the estimated cost is 1.17 million rubles. However, as of 1 January 1983, the contractor, the Sred-azenergostroy Trust, had completed only 640,000 rubles worth of

work. During the years that have passed since the start of the construction project, many assemblies of the unit have arrived in poor condition and have required a lot of money for their restoration. The electric power station is conducting a drawn-out and extensive correspondence on this matter with the contracting organization, the higher ranking organizations and the sanitary and epidemiological station, but the state of affairs at the project is not changing. It is as if time had stopped at the construction site. The windows of the filtering room of the unit look out with blank eyes and drafts of air wander between the steel girders. Meanwhile, the GRES continues to pollute the river with its waste. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 18 Mar 83 p 4/ 8927

TASH-KUMYRSKAYA GES REPORT--The builders of the Tash-Kumyrskaya GES, which is to be completed by the end of the five-year plan, have started work on the machine room a full month ahead of schedule. In order to accomplish this, the builders have switched to the watch work method. Many of them live in Kara-Kul, which is located some 65 kilometers from the GES. The four-hour drive was tiring to the people. For this reason a settlement was built next to the main construction site, where the drivers, excavator operators and installers live a week at a time. After the seven-day watch they leave for a break and are replaced by another shift. The site of the fifth hydrounit on the Naryn River is far from the main industrial base, which supports work on the Toktogul'skaya and Kurpsayskaya GES's. For this reason it was necessary to develop a base of its own. At present the installation of a concrete and gravel-sorting plants is underway using progressive designs. In the difficult mining and geological conditions a tunnel is being drilled, through which the Naryn will be diverted from the main site. Due to fissures in the cliff, the first 20 meters of soft earth was filled in by landslides, which brought work to a halt. But the builders immediately found a way out of this difficult situation. They proposed reinforcing the vaults of the passage with a roof bolting: to drill deep pits and then fill them with concrete. This made it possible to start work again. More than 90 meters, nearly a fourth of the length of the tunnel, have already been drilled. The Tash-Kumyrskaya GES, with its rated capacity of 450,000 kilowatts will provide electricity for new enterprises of the Issykkul'skiy-Chuyskiy Territorial Production Complex. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Mar 83 p 1/ 8927

**KIRGHIZ RESTORING SMALL HYDROELECTRIC STATIONS**--The Kirghiz power engineers, who have an entire cascade of powerful GES's, still have found it useful to return to the use of small, rural hydroelectric power stations. Within the republic a service for the modernization of such power stations has been created. Its specialists have completed the automation of the interfarm GES Sokuluk-2, which had been in mothballs for many years; they have succeeded in converting the power station into a highly profitable enterprise. The chief of the administration of Kirgizglavenergo, M. Azrilyan, reports that through the use of figures it is easy to demonstrate the efficiency of making further use of such power stations as the Sokuluk-2. By modernizing, the rated capacity of the station's machinery has been increased from 1,500 to 2,000 kilowatts. There has also been a corresponding drop in the cost of a kilowatt-hour, down to .4 kopecks. In a year the power station generates more than 8.5 million kilowatt-hours of electricity and will provide some 120,000 rubles in net profit. There are dozens of such power stations within the Kirghiz SSR. Following modernization they will be able to generate up to 70 million kilowatt-hours of electricity each year. As a result, thousands of tons of standard fuel will be conserved. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Mar 83 p 1/ 8927

**ROGUNSKAYA GES REPORT**--The five-year preparation period for the construction of the Rogunskaya GES in the Tajik SSR, the largest power station in the Vakhshskiy cascade, has come and gone. The total rated capacity of the station will be 3,600,000 kilowatts. Work is underway on the underground facilities and tunnels, which to a large extent predetermine the time periods and cost of the entire construction undertaking. The time has come when the designers of this hydrounit, the chief engineer of the project L. Osadchiy, the sector chief for the underground facilities V. Ilyushin, the leading engineer V. Vasil'yeva and others, will be able in actions to demonstrate how realistic and sound was one of the points of their pledges for the 11th Five-Year Plan. During the working design work it was decided to reduce the estimated cost of the underground complex by 4.5 million rubles against a technical design. The combined savings can be seen in the cement, metal and labor outlays that are saved. The designers of the Central Asian Department of Gidroproyekt have justified the possibility of using a more economical design of a cap for the construction tunnels. They have reduced the dimensions of the flow-through portion of the gate chambers, the size and weight of the mechanical equipment, a cross section of the section where the gate chambers connect with the bleed tract, and have recommended a light, thin-walled lining for the tunnels, and so forth. Recently a "fully empowered" specialist visited the construction site, who on behalf of the department brought a draft contract for the creative scientific-technical cooperative effort based on the "workers' relay race" principle between the designers and other participants in

the construction. The contract emphasizes reducing the estimated cost of the construction project. The coordinating council on raising the efficiency of designing, constructing and operating the hydroelectric power stations of the USSR Ministry of Power and Electrification has supported the initiative of the collective of the department. /Text/ /Moscow STROITEL'NAYA GAZETA in Russian 18 Mar 83 p 1/ 8927

MANGYSHLAK PENINSULA TO GET ELECTRICITY--Tens of thousands of kilowatt hours of electricity have been generated by the first power unit of the TETs-3 that is now under construction at the Mangyshlak Power Combine imeni 60 Years of the USSR. The new power unit has a rated capacity of 210 MW and burns local natural gas. Each year there has been an increased need for electricity at the Mangyshlak Territorial Production Complex. The need is particularly acute in connection with the development of the new oil fields on the Buzachi peninsula and the start-up of the USSR's largest plastics plant in Shevchenko. The high-voltage power transmission lines cannot reach this important economic region through the sands that have long been difficult to overcome. For this reason they decided to develop their own power base in Mangyshlak. On the peninsula the world's first atomic power station using fast neutron technology and several thermal electric power centrals have been in operation for many years. None of these power stations have been connected with the Unified Power Grid of the USSR. The TETs-3 was one of the main construction projects on the peninsula. Its first power unit was erected within a relatively short period of time. Within four years the builders and installers completed some 26.5 million rubles worth of work in capital investments. At the project the best collectives from the Caspian Sea area administration, the SMU-82, and other organizations were at work. The high quality of the work and the professional mastery demonstrated by the brigades of Hero of Socialist Labor N. Gordiyenko and also G. Shevchenko, L. Shilin, A. Isakov, and M. Tikhonov is worthy of mention. The new power unit is to reach planned rated capacity in the second quarter of the year. The builders and installers have started work on the second power unit, the completion of which will require significantly less time, although it will be necessary to complete some 15 million rubles worth of work. /Text/ /Moscow IZVESTIYA in Russian 25 Mar 83 p 1/ 8927

TKVARCHEL'SKAYA GRES REPORT--The rated capacity of the Tkvarchel'skaya GRES, the leader of Georgia's thermal power industry, has been doubled. Having completed a large amount of work in modernizing this plant, the builders, installers and adjusters have provided for the ahead-of-schedule completion of the second power unit with a rated capacity of 110,000 kilowatts. This took place exactly 50 years after the narkom of heavy industry Sergo Ordzhonikidze signed an order calling for the construction of a thermal electric power station in Tkvarchel using local coal as a fuel. The Georgian power industry workers were assisted by representatives from many republics and cities of the Soviet Union in the construction project. The modernization effort continued this tradition. /Text/ /Moscow IZVESTIYA in Russian 23 Jul 83 p 1/ 8927



NOVOCHEBOKSARSKAYA TETS-3 REPORT--The sixth power unit at the Novocheboksarskaya TETS-3 in the Chuvash ASSR has been put into operation. The turbogenerator has a rated capacity of 120,000 kilowatts and a boiler with a productivity of 500 tons of steam per hour. /Text/ /Moscow EKONOMICHESKAYA GAZETA in Russian No 3, Jan 83 p 4/ 8927

EKIBASTUZSKAYA GRES-1 REPORT--The Ekibastuz-Omsk 500 kV power transmission line has been placed at industrial load. In this year the line will carry nearly six billion kilowatt-hours of electricity from the Ekibastuzskaya GRES-1 to Western Siberia. /Text/ /Moscow EKONOMICHESKAYA GAZETA in Russian No 3, Jan 83 p 4/ 8927

FLOOD WATERS AT THE SAYANO-SHUSHENSKAYA GES--The flood water peak at the Sayano-Shushenskaya GES came in June. With the addition of five assemblies electricity was being produced on the magnitude of the 23rd billion kilowatt-hours, which the station has generated since it was first put into operation. The water in the Sayanskoye Sea at the crest of the dam reached 125 meters of head. Specialists feel that another four billion cubic meters of water were added to the six billion that had already accumulated in the reservoir. This means that the now-achieved 24-hour output might double and, in spite of the caprices of nature, the power station will produce more than nine billion kilowatt-hours of electricity this year. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Jun 83 p 2/ 8927

ZELENCHUKSKAYA GES REPORT--Twenty meters - the underground portion, and 18 meters the above-ground portion - these are the dimensions of the building of the Zelenchukskaya hydroelectric power station. The GES will go up on the shore of the Kuban River. But four of its power units of 80,000 kilowatts each will put to use the water of the Malyy and Bolshoy Zelenchuk rivers and the Aksaut and Marukha rivers. A canal will make it possible to put them together into a single riverbed. It will reach the top of the mountain where a spot has been selected for a 24-hour regulated reservoir. This is some 240 meters above the GES building. Such a head of water will "put stress" on the hydrogenerators, which is fed to them through two tunnels. Further down the Kuban River the Verkhne-Krasnogorskaya and Nizhne-Krasnogorskaya GES's will be built. Their combined total rated capacity along with the Zelenchukskaya GES will be 530,000 kilowatts. The main purpose of the construction undertaking is to increase the feed of water from the Kuban River into the Great Stavropolskiy Canal by draining the mountain rivers. The realization of this concept is making it possible to create a cascade of hydroelectric power stations. The first station in the cascade will be the Zelenchukskaya GES. /Text/ /Moscow PRAVDA in Russian 15 Aug 83 p 2/ 8927

**SURGUTSKAYA GRES REPORT**--The Surgutskaya GRES, the first born of the West Siberian power industry, is nearing completion. Beneath its roof they are finishing up the installation of the final, the sixteenth power unit with a rated capacity of 210,000 kilowatts. The Surgutskaya GRES is a shining example of the development of the Tyumen north. Like the oil fields, it is built among swamps and ageless taiga. Since that time much has changed. The tracks of the railroad have come here joining Surgut with the industrial centers of the Soviet Union. According to plan the sixteenth power unit was to be completed in November. But the installers set the completion date in October. During their operation the units of the Surgutskaya GRES have already generated some 140 billion kilowatt-hours of electricity. This power is going to the oil and gas fields of West Siberia and to the cities and settlements of the Tyumen north. Natural gas will serve as the fuel for the power station. Previously the gas was flared in the fields; and now it serves the five-year plan. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Aug 83 p 1/ 8927

**AGADYR-DZHEZKAZGAN 500 kV POWER LINE**--The 500 kV electric power transmission line from Agadyr to Dzhezkazgan has been placed on industrial load. Power from the first Ekibastuzskaya GRES has been delivered through this power line to the major center of non-ferrous metallurgy. /Text/ /Moscow IZVESTIYA in Russian 8 Jul 83 p 1/ 8927

**ANDIZHANSKAYA GES REPORT**--The first two assemblies of the Andizhanskaya GES has generated industrial current. The rated capacity of each of the units is 35,000 kilowatts. Next to it they are installing another two units - their completion is slated for the end of the year. The water of the Andizhanskoye reservoir will make it possible to irrigate some 40,000 hectares of virgin land and to improve the water supply for 400,000 hectares of plowable land in the Fergana Valley. And the new GES will provide energy for the cotton and livestock farms that are being developed here. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 May 83/ 8927

**KANSK-ACHINSK FUEL AND POWER COMPLEX REPORT**--The student construction detachments at the projects of the Kansk-Achinsk Fuel and Power Complex have concluded their regular labor semester with an unprecedented result. Some 1,865 representatives from Moscow, Leningrad, Baku, Sverdlovsk and Krasnoyarsk completed construction and installation work valued at 4.5 million rubles, which is twice the amounts of last year. The industrial projects of the Berezhovskaya GRES and the Itatskaya substation, housing units, schools, kindergartens, and sports facilities for the settlement of power workers - these are the highlights of the semester, in which the student detachments distinguished themselves. Some 15 of the projects were given the students Mark of Quality. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 31 Aug 83 p 1/ 8927

**SHULBINSK-AYAGUZ 220 kV POWER LINE**--The 220 kV electric power transmission line running between Shulbinsk and Ayaguz will provide a significant improvement in the supply of power to the southern regions of Semipalatinsk Oblast. Its second section from Zhangiz-tobe to Zharma, a distance of 68 kilometers, has been put on load. Further into the steppe run the supports of the new power bridge. The inexpensive energy of the future large hydro-electric power station on the Irtysh River will ensure the rapid development of industrial and agricultural production and will lead to the territory of farms and divisions of the state and collective farms and to the sectors of livestock raising. This year the builders of the Pokrovskaya mechanized column from the Kazelektrosetstroy must complete the final section of the power transmission line from Zharma to Ayaguz. The installation of the supports is proceeding at full speed, as is the suspending of the wires. All of the work in building the energy bridge is to be completed by Power Workers' Day. According to a report from the director of the Semipalatinsk electrical network enterprise, D. Chegasev, within the oblast they are continuing to switch to a centralized power supply for all workers' settlements and remote villages. Now they must lay more than 500 kilometers of power transmission lines, chiefly to the shepherds' villages, milk complexes and other facilities of the agroindustrial complex. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 23 Feb 83 p 17 8927

**ARMENIAN POWER TRANSMISSION LINE**--With the arrival of excellent weather work has speeded up in the construction of a power transmission line, which starts in Yerevan and through the Araratskaya Valley proceeds towards Babek - the new regional center in Nakhichevanskaya ASSR. The power line will close the Transcaucasus network in the southwestern portion of the region and will improve the power supply for Armenia and Azerbaijan. The chief of the section of the mechanized column No 23 of the Kavkazelektroset of the USSR Ministry of Power and Electrification, Kasum Kasumov, reported that the path of the power line passes through difficult terrain. Mountains, high slopes and rocky soil complicate the work. In the winter the frost in the mountains reaches 40 degrees below freezing. For now these difficulties are behind them and they are picking up the pace. The assignment for March was overfulfilled. The chief of mechanized column No 234, Ikhtibar Dzhabiyev, reported that for this key project one more brigade of installers has been sent in and more equipment has been earmarked for the project. Nearly 50 kilometers of the power line are already prepared. The builders have promised to complete the line at the end of the second quarter rather than in the third quarter. /Text/ /Baku VYSHKA in Russian 14 Apr 83 p 17 8927

ARMENIAN POWER LINE REPORT--A nearly 100 kilometer power bridge has extended from near the Shirakskaya Valley of Armenia. Today the high-voltage power line from Oktemberyan to Leninakan has been placed on industrial load. Now the Armyanskaya AES has started supplying electricity to agroindustrial complexes in the northwestern regions of the republic. A major contribution to the realization of the Food Program is being made by the power workers of the republic. Hundreds of LEP's are providing current to the collective and state farms, the interfarm enterprises, which have been switched to an economical centralized power supply system. Now a new stage in rural electrification has begun: reserve power transmission lines are being erected and the networks are ringed together. This is providing continuous power supply to the enterprises of the agroindustrial complex of the republic. /Text/ /Moscow IZVESTIYA in Russian 25 Mar 83 p 2/ 8927

EKIBASTUZ POWER REACHES KOKCHETAV--Ekibastuz energy has reached Kokchetav. The first section of the super-long distance power transmission line from Ekibastuz to the Urals has been put into operation. On a temporary basis current at a voltage of 500 kV has been fed into the line. The power line is moving further along its way toward Kustanay. On the path of the power line all foundations have already been installed and more than half of the supports are installed. Preparatory work is underway on the Kustanay-Chelyabinsk section. The Ekibastuz-Omsk LEP-500 has been placed on load. The collective of the Tselinelektrosetstroy Trust has installed the first foundations beneath the high supports of the power system, which will link Ekibastuz with Barnaul. /Text/ /Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 83 p 18/ 8927

UST-ILIMSKAYA GES REPORT--The north of Irkutsk Oblast is changing rapidly. On the section of the route from Lena to Lake Baykal, in the former taiga barrens, six settlements have been built. Thanks to the second path to the ocean the ancient city of Ust-Kut has once again come to life; in recent years the population of this city has doubled. In Ust-Kut the rails of two railroad lines are joining together - the East Siberian Railroad and the Baykal-Amur Railroad. Yesterday strictly according to schedule trains from Lena reached the railroad stations of Korshunikh and Kunerma; and this was done using electricity and fuel that had been conserved. The BAM has given a push to the rapid development of the Kazachinsko-Lenskiy rayon. Yesterday the residents of the settlements of Ulkan and Kunerma continued to build the timber transport system /Ilestranskhoz/. Starting next year the new enterprise will begin producing more than 100,000 cubic meters of lumber products. Energy from the Ust-Ilimskaya GES has reached the settlements along the path. Yesterday the brigade of CPSU Central Committee member and Hero of Socialist Labor L. Kazakov did a good job of building a house for the power workers at the Kirenga railroad station. The brigades of L. Znakhurenko, G. Yevdokimov, while erecting at the sovkhos Podymakhinskiy a dormitory and school, overfulfilled the assignment by one and half times. The truck drivers for the



BAM have helped the geologists who are working near the Nepskiy Arch. Here, not far from the northern Transsib Railroad, the collective of the Vostsibneftegazgeologiya /East Siberian Oil and Gas Geological Prospecting/ Association has discovered a deposit of potassium salt, brown coal, oil and gas. A communist subbotnik has hastened the day when these underground treasures will be developed. /Text/ /Moscow PRAVDA in Russian 17 Apr 83 p 2/ 8927

ELECTRICITY FOR OIL FIELD--The power transmission line linking the Bakinskaya GRES imeni Krasin with the oil and gas extraction administration imeni 26 Baku Kommissars extends some 30 kilometers altogether. However, the energy fed through this line will enable the oil field workers to conserve each day up to 100 tons of fuel. In order to increase oil production, they are pumping hot water into the wells. Previously oil was used to heat the water. The completion of the second power unit of the Azerbaydzhanskaya GRES has taken some of the pressure off of the other Baku electric power stations. A portion of the freed electricity has gone to the oil industry workers. Their estimate was simple: to heat the water it is cheaper to use electricity. /Moscow PRAVDA in Russian 20 Feb 83 p 2/ 8927

LOW TEMPERATURE INSTITUTE REPORT--The scientists of the Physico-Technical Institute of Low Temperatures of the USSR Academy of Scientists (Kharkov) and specialists from the Leningrad Production Association Elektrosila imeni S.M. Kirov have completed tests on an experimental electrogenerator with a rated capacity of 5,000 kilowatts with a super conducting excitation winding. The development of present-day electric power has been directed toward the steady improvement of the per-unit rated capacity of electrical equipment. However, raising this indicator is encountering many difficulties. First, the size and weight of a generator are increasing. Raising the per-unit rated capacity of a generator by 2.5 to 3-fold, without changing its weight and size parameters, permits the phenomenon of super conductivity (which occurs in certain materials at very low temperatures when electrical current travels through a conductor almost without resistance, which means without losing energy, thanks to which such machines have a very high coefficient of efficiency). The tests that are being completed on the experimental electrogenerator have affirmed the correctness of the design solutions. For the first time the windings of excitation over a long period of time remain stable in a super conducting state at nominal indicators of rpm and excitation current and at a rated expenditure of liquid helium, which cools the superconducting winding. The results of the tests have shown that other parameters of the generator coincide with the estimated values. The 5,000 kilowatt experimental generator, which was subjected to the tests, is a model of the first industrial electrogenerator of this type, the rated capacity of which will be

300,000 kilowatts. It is now being developed by the Leningrad Association Elektrosila with the participation of other collectives, including the Institute of Electric Welding imeni Ye. O. Paton and the Physico-Technical Institute of Low Temperatures. In the future, scientists believe, the development of an electro-generator, which makes use of the phenomenon of super conductivity and has a rated capacity of 2.5 to 3 million kilowatts, will become a reality. /Text/ /Kiev PRAVDA UKRAINY in Russian 9 Feb 83 p 47 8927

SPANDARYANSKAYA GES REPORT--The collective of the hydrogenerator shop at the Elektrosila Production Association is successfully fulfilling its socialist obligation which it undertook in honor of the 80th Anniversary of the Second Party Congress. It began shipping assemblies for the second hydrogenerator at the Armenian Spandaryanskaya GES one month ahead of schedule. At the request of the installers a stator for this machine was manufactured in the first section. A. Luzhin's brigade of winders is setting the tone for the competition, reported the chief of the hydrogenerator shop, N. Krol'. The brigade has achieved a significant ahead-of-schedule pace during the manufacturing of the first assembly for the Spandaryanskaya hydroelectric power station; and the experience that they have accumulated is now being put to good use. The brigade, which is working against a single order, is finding reserves of efficiency in its possession of related specialty skills: the majority of the winders are successfully handling their insulating, carpentry and assembly operations. Many of the production workers have switched to the brigade labor method. The new hydro-unit in Armenia completes the cascade comprised of three hydroelectric power stations, which have been built on the high-mountain Vorotan River. All of these power stations are equipped with machinery bearing the Elektrosila trademark. /Text/ /Leningrad LENINGRADSKAYA PRAVDA in Russian 30 Jun 83 p 17 8927

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